

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

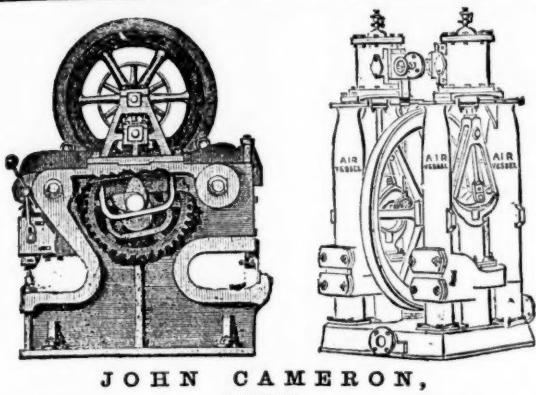
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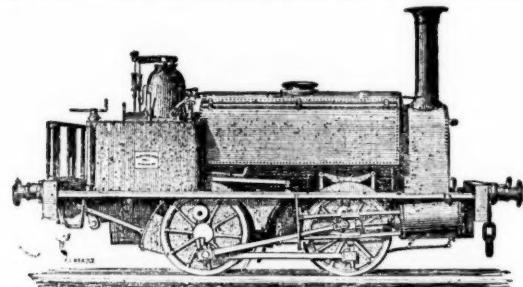
No. 2003.—VOL. XLIV.

London. Saturday, January 10, 1874.

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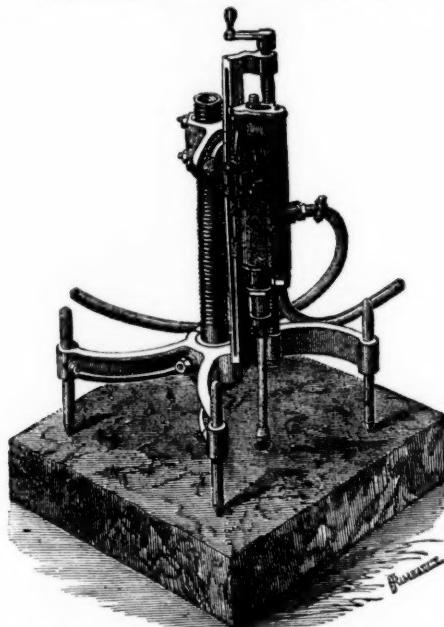


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SIR,—I have minutely inspected the Patent Self-acting Dressing Machinery you have erected at the Great Darren and Bodcawl Mines. I do not hesitate to say that it is by far the most perfect machinery for the purpose I ever saw. The self-acting arrangement is complete, no labour being required to obtain a clean product from the crusher, under the very finest granular particles, while the slimes are conveyed direct to the buddles without settling pits. The system must save at least two-thirds of the entire labour cost, and a considerable amount of ore, which would otherwise be lost, and will, most certainly, be adopted where these considerations are an object.

Mr. George Green, Mining Engineer, Aberystwith.

HENRY TYACK.

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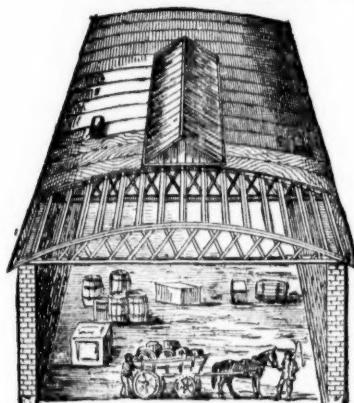
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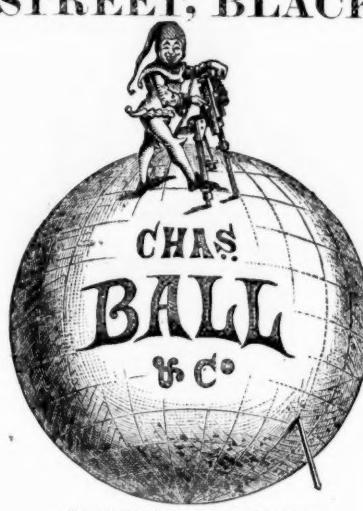
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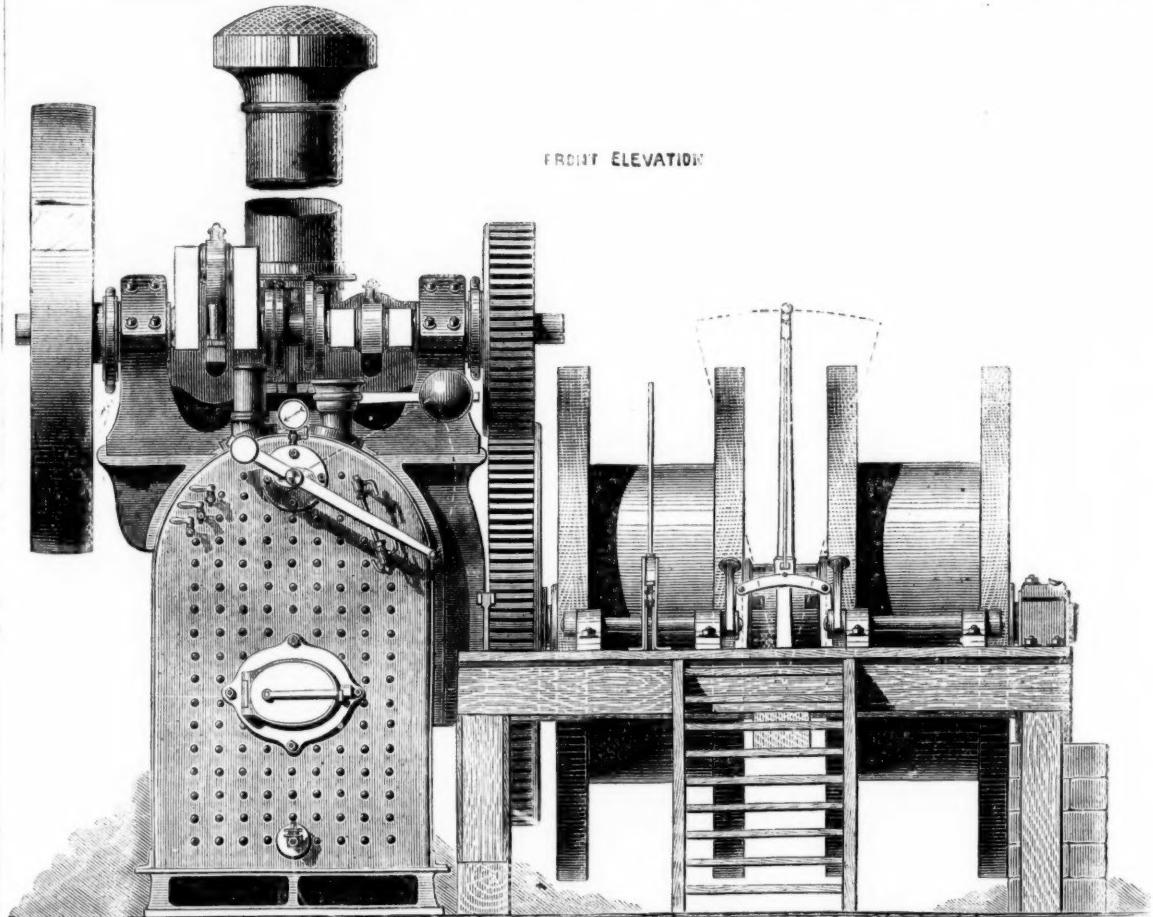
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Original Correspondence.

MINING IN UTAH—THE EMMA MINE.

SIR.—The controversy between B. A. M. Froiseth, of this city, and S. T. Paffard, has culminated in a somewhat deplorable manner in personalities. Facts, not persons, are the objects to be aimed at or vindicated, and Mr. Paffard, at least, ought to remember that a discussion to be gentlemanly must be impersonal. Of the two contestants Mr. F. undoubtedly has the merit of unimpeachable sincerity and disinterestedness of purpose; and Mr. Paffard, before writing his letter of the 15th ult., had better concede that neither resorts to ridicule, nor evasion of the disputable points, are valid arguments or honourable warfare. Mr. Froiseth never claimed to be a professional geologist, nor to state authoritatively the value of the "Emma" in dollars and cents; he simply controverted the statement of Mr. P. as to the mine being worthless, by contending that the sale, relatively at least, was a justified one, and would, no doubt, vindicate itself in due course of time. If anyone is to be held responsible on the score of geological shortcomings it is most assuredly the expert in charge, who at the request of T. W. Park, examined the mine and masticated it ready for the English market.

It is most assuredly an ungrateful and an almost hopeless task to try to redene Utah mines in the English opinion; but the amount of insufficient information, of prejudice and misrepresentations wilfully circulated, may justify the writer in giving an impartial *résumé* of the mining status of Utah in general, and of the British mines in particular. The extent and value of Utah's mining resources, in a certain sense, have been rather overrated; there can be no doubt about it to any cool-headed and clear-thinking mining man. I say mining resources, and I mean by that not only the extent and intrinsic value of our ledges but, what is equally and sometimes even more important, the lack or presence of facilities: the supply of building material, of timbering and provisions; the easy accessibility at all seasons; cheap labour, cheap fuel, and an abundance of water. Paramount in importance there are the regularity and uniformity of deposits, the exemption from litigation, an efficient, honest, wide-awake management. Given all this, and the qualitative value of the lode is almost immaterial. In any part of the world the best paying and most permanent investments are not the rich mines, but the large bodies of (comparatively) low grade ores (*vide* Australia, England, Germany).

Mining is at best a lottery; both the gains and the blanks are incomparably larger than in any other kind of business. To the uncertainties which necessarily beset every commercial venture there join in mining life features vastly more radical and sweeping—rich strikes or pinching out, soft ground to work in, or caves, irruption of water, &c. Yet, not only is the extra amount of foresight, prudence, and energy, which necessarily is demanded in hazardous enterprises, usually sorely lacking, but even the commonest requirements of business life, good accountability, watchfulness, foresight, and integrity are hardly ever met with.

The failures of most of our foreign mining companies here would exemplify this in one or several of these instances. In looking over the doleful list of English investments here, such as the Tecoma, Flagstaff, Emma, Utah, Camp Floyd, &c., a careful observer is easily enabled to assign to each one its true cause, and the satisfaction of seeing one's provisions realised is not a very gratifying one. Wilful deception, and self-deception, recklessness, carelessness, un-business-like habits, incompetency, stock-jobbing, extravagant salaries of officers and employees, litigation, improper organisation, and sometimes even dishonesty—these are the causes of disappointment and failure to our British cousins. It is needless to particularise, and to point out the respective applicability of these assertions to each of the above-mentioned concerns, as every shareholder and honestly inclined mining superintendent will only too willingly endorse their appropriateness. It is great mistake among shareholders to subscribe to, and an equally great one for mining experts to report on, mines solely in view of the quality and quantity of ore exposed. When I first visited Cottonwood at the close of April, 1870, and saw the wretched state of communications, I gave the people there credit for a great deal of Chauvinism, or ignorance of mining, or both, to talk so blusteringly as they did of the scores of fortunes which were up there in store for them. Though, when speaking of "fabulous riches" and "untold wealth," I could afford to hear them quietly, because I knew, from long experience, the difference between wealth *in situ* and wealth in the pockets of the investors. Another and more fatal mistake which British shareholders are apt to make is the overstocking of mines. It seems to be a fatality which drives them to subscribe only for the most expensive and the most foolishly or criminally extravagant schemes. Sound and really deserving mines do not need any artificial bolstering, and there are but very few ones in Utah that at any time during the last three years could not have been purchased at a price below \$100,000 from the vendors themselves. But a great deal of responsibility rests with the English promoter. Pandering to the widely-diffused notion that only ballooned up schemes will take with the English public, and yielding to his own unscrupulous cravings, he floats a mine which had been offered to him for (say) \$50,000—for \$100,000, \$200,000, even \$500,000, reserving for himself, of course, the lion's share. It is to be regretted that such a prejudice should exist; but that it does has been only too often verified, and it has as well been referred to and deplored by English mining men themselves in the columns of the Journal and other papers. As a community, we would rather be without such mammoth schemes. So far from being a guarantee of success or a matter of pride to us, they are almost sure to end in decay and ruin. It does not bring us a cent additional gain if a mine, instead of being stocked for \$100,000, is stocked for \$500,000 so long as the capital subscribed is sufficient to defray current and developing expenses; but it is very probable that in the latter case the concern will go to the dogs. None but low and venal people, and none but a servile press, could applaud transactions such as have taken place at various times from this Territory of comparatively worthless properties for extravagant sums. The sale of the Dartmouth, Belshazzar, and Red Warrior to the United States Mining Company (Limited), for the consideration of \$450,000 was, outside of a certain class of people, deeply regretted by the community. It appeared to some more pernicious or less hypocritical than the others that this transaction was the first ring in the death-knell of Utah, and so it has happened. Next came the Emma operation, the floating of the mine for \$5,000,000—a consideration which some old fogies here thought was just about five times over and above what the property was really worth. Then the Camp Floyd (Sparrowhawk) fizzle; the Tecoma, the Last Chance, the Flagstaff, *ad nauseum*.

Mines, let it be remembered, ought to be viewed like investments on transatlantic steamships; they ought to pay for themselves in twelve months. Even the payment of the vendors, wholly or partially, in shares will not, as the "Utah" transaction has demonstrated, save the *bona fide* shareholders from discomfiture, the vendors having it sometimes in their power to bully up the stock sufficiently to sell their shares.

The only mode to acquire a really deserving property for a moderate figure, and to have it worked in a thoroughly trustworthy manner, is to enter into connection with one or several joint owners of a mining claim, furnish the capital and develop the mine on shares. Of course the capitalists would own the controlling interest in the concern, the original owners or locators only retaining so much as would ensure their unfailing co-operation in the success of the enterprise. This, in theory, is undoubtedly the best plan—it would benefit the contracting parties direct, and would make the greatest good faith on both sides indispensable. But in practice the plan may present many difficulties, one of which, for instance, is that of entering into mutual relations. A Mining Bureau has been, and still is, being sporadically started in various parts of the West to meet the want; but however honourably, to all intents and purposes, it may have been organised and be conducted, yet occult influences begin to manifest themselves sooner or later, private interests to crop up, to reduce the Bureau down to their schemes and to their purposes. It does not take very long to swamp the reputation of the respective Bureau, and similar institutions, for ever.

Where two or three or half-a-dozen shareholders club together and co-operate heartily, sincerely, they will succeed in making money in Utah as well as anywhere else; but the larger the number of shareholders the greater the inducements for "jobbing." This is true, not only of mining but of any kind of industrial pursuits. Where the shareholders have not a professional man among themselves to come and examine the property (which is always the most desirable), they will exercise the greatest vigilance in selecting an agent competent, sober, incorruptible. In most of the mining companies the disaster begins with the report of the examining engineer (of course he cannot be held responsible for ulterior frauds, such as dabbling in stocks, &c.), but it is safe to say that in four cases out of five the woe and weal of a mining company depend on his disinterestedness, his sobriety, his experience, and knowledge. And in this connection, let me say one word about American mining engineers and American geologists.

The expert in charge of the Emma was an American, it is true, but who godfathered the Tecoma, the Last Chance, the Camp Floyd (Sparrowhawk)? Who engineered through the Utah property in spite of the American consulting engineer's warnings? Who were successful in running down the Flagstaff Company's shares from 14*l*. to 3*l*. in less than eight months? Were they not Englishmen? Which American mining inspector would have taken \$50,000 for doing nothing, or at best doing mischief? Would we Yankees have left two furnaces cold during two months, under pretence of building others, and sold our ores meanwhile at a loss, if we had not had motives other than those of sheer laziness and carelessness? I venture to say hardly. What our brethren beyond the waters may think of their representative countrymen, Messrs. Brydges Williams, M.P., and Geo. Anderson, M.P., who came here nearly two years ago to examine the Emma, Utah, Camp Floyd—they know best by themselves. Mr. Paffard, for one, may continue to declaim against the absolute worthlessness of all American mines, and the utter depravity of American vendors; but so long as we fail to see that British investors are doing their best, or doing even a little towards holding their own, so long we shall contend that there is money to be made in Utah for those who are willing to take it, and who know how to do it.

TIMPANOGOS.
Salt Lake City, Dec. 12.

COLORADO MINES AS A FIELD FOR INVESTMENT.

SIR.—From my previous letters you will have seen that my principal object was to point out the solid advantages presented by Colorado mines as a field for the judicious investment of English capital, and as a warning to avoid the schemes, as plausible as they are fallacious, which professional speculators are continually trying to palm off upon the English public. It is the heavy companies that have so long depressed mining in Colorado; hundreds of thousands of dollars have been spent over and over again on mills and other reduction works before the mines have been thoroughly explored to ascertain the quantity and quality of the ore, and, when finished, have as often been found utterly worthless, or have remained idle for lack of material to keep them in motion. It was, therefore, with deep regret that during a recent tour through Park and Summit counties I observed the same suicidal policy being carried out by an English company in Hall Valley, Park county. This company has purchased a number of lodes and locations on the very crest of the Rocky Mountains, most of them above timber line, and for seven or eight months of the year nearly inaccessible. The principal one, the Whale lode, has a pay streak of from 6 in. to 2 ft. of low-grade ore. To every practical miner here it is well known that these mines can only be made to pay under the most advantageous circumstances, while their almost inaccessibility can scarcely fail to bring failure on the undertaking. Again, this company, like their predecessors, are expending thousands upon thousands of dollars upon railroads and mills before they have explored any of their mines, except to a very insignificant extent, and before they can know whether or not they have any ore to reduce.

Let intending investors come out here, and with the assistance of some uninterested practical miner personally examine the mines of this and the neighbouring counties of Park, Summit, and Boulder, and they can find investments as good as that of the famous Park Pool Association, which in three months of the present year divided \$30,000 on a paid-up capital of only \$20,000. DANIEL ROBERTS.
Georgetown, Clear Creek Co., Colorado Territory, U.S., Dec. 16.

MINING IN ARKANSAS—KELLOGG GRAVEL HILL.

SIR.—Some friend has had the kindness to forward me a copy of your great Journal of Nov. 29. To say the least for this distinguished kindness, I hardly know how to be sufficiently thankful. From it I have obtained more information in regard to American mining interests than in a dozen of our most extensive mining and railway journals—even a special devoted to the great lead mine nuggets of Joplin, Jasper county, Mo. But from the depressed state of affairs in this "neck of the woods," I am fearful that but little effort will be made to develop the greater mining interests of the Kellogg Gravel Hill silver and lead district of this county until next spring or summer. And from this depression of financial affairs in the great south-west, it affords the English public an opportunity for investing in one class of wild, undeveloped, though reliable mineral lands that will not occur again in all probability in a lifetime. Reliable mineral lands, both silver, lead, zinc, or iron, the Beidler out-cropping ten-acre tract of good silver-lead, or the Watkins' eighty-deep diggings; the Moreland, or the Nieman Gravel Hill Kellogg, with developed mines, each tract of 160 acres can be purchased at nominal figures. These mines, outcroppings, and hills are profusely filled with ores, which assay as much as 313 ounces of silver to the ton, and 63 per cent. of galena. Specimen ores of the Gravel Hill, at Messrs. Baring Brothers, unless deposited in the British Museum for public exhibition, I should be glad if some responsible English assayer would get possession of that sack of precious ores and assay for the benefit and information of the English investors in American properties. Your English capitalists would be somewhat surprised at the large amount of precious metal contained in a lot of refuse "offal" ores picked up around the old Gravel Hill pit or mine, which has not been worked for more than 20 years. In fact, there has not been any mining of importance prosecuted in that "neck of the woods" since the war, the cause being want of mining capital. If the lot of specimen ores before mentioned were assayed and the results published, I doubt if mining property as reliable as the Kellogg Gravel Hill would longer remain idle for the want of adequate capital to delve among its undoubted rich ores, which will bear the strictest investigation, and can be purchased at \$100 per acre. Thousands of acres of reliable undeveloped mining lands can be purchased here at from \$5 to \$25 per acre. And I am in a position to state, from a thorough knowledge of this county, and, in fact the State, with regard to her mineral treasures, that though to a great extent yet undeveloped, the day is not far distant when this State will more than rival the Nevadas in its yield of silver-lead ores.

If some of the new companies organising for investment in American mining shares and prospecting companies stocks would include Arkansas in their yearly rounds in search of reliable mineral lands in the Far West, beyond the great Father of Waters, and would furnish genuine information as to the selection of mineral lands of real merit, whether purchases were made or not, many thousands of pounds would be saved; and the large number of mining engineers annually sent to the mountains by English companies would, I am sure, be directed to prospect the richer ore fields of the Kellogg lead-silver or silver-lead district of Arkansas, particularly the Gravel Hill outcroppings and mines of this county. S. H. NIEMAN.
Little Rock, Dec. 20.

ROCK-DRILLS.

SIR.—In last week's Journal "R. B." says (alluding to Rock Drills) "the Excelsior seems to have but little inclination to work at all." Allow me, as the inventor and patentee of that drill, to inform "R. B." that whenever he pleases to come he shall see the Excelsior rock-drill penetrate hard granite at the rate of 4 in. a minute with a pressure of 25 to 30 lbs. per square inch. He shall also see the same drill commence to work with a pressure of 12 lbs. per square inch,

and he shall acknowledge that the instrument is simpler, and composed of fewer joints, than any rock-drill yet made.

E. EDWARDS, Engineer and Patent Agent.
Southampton-buildings, Chancery-lane, Jan. 8.

THE MCKEAN ROCK-DRILL.

SIR.—We reply to "Readers of the 'Mining Journal'" of last week, that it is immaterial for all practical purposes what the nature of the stone may be on which our drilling machine is put to work. To what extent a succession of blows made by the piston upon rock of the most extreme hardness will affect the solid piston itself, as compared with the effect upon it of the same force exerted upon softer rock, is only to be determined after lengthened working and by careful comparisons. What we affirm is, that the working of the machine in whatever nature of material does not tend to break or derange any part of the mechanism. A block of copper furnace bottom was lately sent to us for experiment, and said to contain from 70 to 80 per cent. of pure copper. With an ordinary pressure of steam the machine would bore this at the rate of (say) 2 inches per minute. It will bore in Aberdeen granite 4 to 6 in. per minute with a plain round bar of steel, without any point whatever, but no great depth could, of course, be attained for want of clearance.

Your readers will, probably, have to fear that much of the correspondence relating to rock drills thus far is more than anything else a partisan appreciation by each writer of the particular machine in which he is personally interested. It is for this reason that we have heartily supported the proposition for a public competition that would enable all parties interested to judge of the merits of each machine when reported on by a thoroughly competent and impartial jury. Without further trespassing on your columns to show, as we might, the estimation in which our machine is held, by the fact of its rapid extension to various parts of the globe, we will content ourselves with again expressing the hope that some arrangement for a general trial will be accepted and carried out.

At a future time we should be glad to discuss the question of air-compressing machinery, as we think Mr. Ball has given his endorsement to machinery for this purpose which is almost as "antiquated" as the "Mont Cenis Drill."

The advantage to the world in the means of producing wealth furnished by the application of compressed air, rock drills, and dynamite, is at present immense, and what it may soon become is incalculable.—32, Lombard-street, Jan. 8.

MCKEAN AND CO.

NOTTINGHAMSHIRE COAL FIELD.

SIR.—The collieries in Nottinghamshire are being rapidly pushed forward, and will be of the first magnitude, and when complete each colliery will have an output of 1000 tons per day. At the present time there are New Watnall, Newstead, Linby, Bestwood Park and others; at each colliery they are sinking through the magnesian limestone. The eastern part of the county has an inexhaustible supply of coal, and in a few years will be one of the largest and most productive districts for the number of collieries, as the estates run very large. Where the kings of England, bold Robin Hood, and the noble friars chased the deer in Sherwood Forest we can now see large chimneys rising on all sides, showing that the immense riches that lie under the royal hunting field are being developed. Forty years ago it was generally believed that the coal measures were not even supposed to lie underneath the immense forests, and some of the estates have changed hands without reserving their mineral rights; but as it is now understood that they are under, and no doubt they extend to the east, their development is only a question of time, as the depth will be great. There is, however, an advantage even in that, as deep coal is easily got, and would not require coal-cutting machines to hole it, as by the superabundant weight and the pent-up gas renders the coal can be easily got, and labourers can be employed to fill the coal, wooding being the principal part of work.

No doubt the coal resources of England will be very much drawn upon, and that many collieries will be worked out in 10 or 15 years, but there is an abundant supply from Doncaster, 60 miles south and south-east, and no doubt it will become one of the future coal fields of England. There is also an immense quantity of iron ore in Lincolnshire, which will eventually be worked when the railways are opened, as it is got with less expense than the clay ironstone. Supposing that the great Midland coal field should not only extend into East Leicestershire but that it should continue through Rutland and Northamptonshire, the fact that the boring in the South of England has again proved that the secondary formation thins away and is often wanting in some localities should not prevent us from believing that coal exists nearer London than is anticipated. If we could raise our coal where we have an abundance of iron ore we may still keep our position as an iron-producing country.

ADVANCE.

COAL A DANGEROUS CARGO.

SIR.—Under the above heading I lately addressed to you a letter in which I pointed out the dangers of explosion attending the conveyance of coal on board ship, as evidenced by several exhaustive enquiries made under direction from the Board of Trade.

That explosion is not the only danger to which a vessel carrying coal is subject, from the nature of its cargo, cannot be doubted for a moment. There is another, and perhaps more serious cause of accidents in what is termed "spontaneous combustion," which assumes especial gravity from the fact that it is only on long voyages that casualties arise from it, which are themselves confined to one particular branch of the coal trade—to that carried out with the South Pacific Coast. The smelters of Chili and other South American States, being in want of cheap coal, are, naturally enough, supplied not only with the cheaper sorts of small coal, but by preference with those small coals which cannot find a better market in England or in Europe generally. Of this particular branch of the coal trade, Swansea has practically a kind of monopoly.

Generally speaking, the coal shipped from Swansea and two or three other Welsh ports for the South Pacific Coast is almost exclusively bituminous, or what is commonly called "binding" coal. It is much sought after, owing to the facility with which it may be mixed with the coal of those southern countries to which it is exported. It is chiefly supplied from collieries situated in the neighbourhood of Swansea, and oftentimes it is shipped "through and through"—that is to say, large and small, just as it comes from the pits. But, inasmuch as the largest of this description of coal fetches higher price at home as house coal, the cargoes made up for the Pacific generally contain a larger proportion of small coal, from which an increased liability to ignite arises as a matter of course.

It is not an unusual practice among colliery owners to keep a stock on hand, which is frequently left without any shelter, and much exposed to moisture. Other coalowners send their coal from the pit directly to the ships, but then it is, as a rule, shipped wet, as it is generally moist when got out, and subsequently exposed for some hours to the rain in railway trucks, besides having, on account of its smallness, absorbed much more water than it would if it were in larger lumps. The coal thus shipped will only be partially dried by the wind, and not until a considerable time has elapsed. From either of the two causes stated it follows that the coal on board ship must always be and remain more or less wet, whereby its liability to heat and to ignite is naturally enhanced.

Bituminous coal is the kind mostly chosen for exportation to the Pacific, on account of its binding or caking properties, which, as I have said, make it more suitable for mixing with the native or anthracitic coal for smelting purposes. Now, this bituminous coal is still in progress of decomposition, that is to say, it is still passing through those stages which have already been gone through by steam-coal and anthracite, and this forms an additional feature of liability to spontaneous combustion with which the South Pacific coal trade has to contend.

There is yet another substance often to be met with in the kind of coal alluded to, and which may be termed the greatest defaulter in the matter of spontaneous combustion. I am speaking of iron pyrites, or bisulphuret of iron, which some coalowners hold "ought not to be found in coal intended for so long a journey," but it is found, and sometimes in very large quantities too. To this injurious

substance may be traced ninety-nine out of every hundred cases of spontaneous combustion.

Thus, the causes from which spontaneous combustion arises on board ships carrying coal to the Pacific coast may be classed under four heads:—1. The bulk of the cargo and the smallness of the coal. 2. The presence of moisture. 3. The liability to progressive decay. 4. The chemical composition of the coal.

The first two causes require the existence of either of the last two, but no one of the causes enumerated can produce spontaneous combustion by itself.

In my next letter I purpose to show how the spontaneous ignition of coal possessing at least three of these four injurious properties is brought about.—7, Carlton-square, New Cross. A. VASSARD.

ON OPENING MINES FROM SURFACE.

SIR,—As the columns of your valuable Journal are always open for the discussion of subjects appertaining to mines and mining, and that you have many very able correspondents on such topics, will you please allow me space for a question on Opening Mines from Surface. In the first place, no doubt you are aware that Cornish mining on metallic lodes is started generally by vertical shafts sunk on the hanging side of the lode, with a view to intersect the lode at a given depth, varying, I may say, from a few feet only to 150 fms. or more. Then the shaft is turned on an angle with the lode, and when the vertical part is several fathoms deep, cross-cuts are put out to cut the lode at every 10, 12, or perhaps 15 fms. in depth, &c. The question is, Why is this plan chosen in preference to that of sinking from surface in the lode? We must allow, "exceptions will creep in in all rules," but take this matter as a general rule. Perhaps the engineer will step in and say, "Give me a vertical shaft for my rods and pumps to lift the water, and the engine shall give better duty. Economy in coals." So far so good. But when the shaft intersects the lode, and is gone off with it, forming a heavy angle in both rods and pumps, what is it then? To this end: Suppose we sink two shafts—No. 1 shall be 50 fms. vertical, and 50 fms. on course of the lode, say an angle of 45°, total 100 fms.; and No. 2 shaft shall be one straight line on course of the lode on an angle of 45° from surface, attaining the same vertical depth as No. 1. In which of these shafts would an engineer place his rods and pumps with a view alone to economy for raising any given quantity of water, allowing each shaft would have the same quantity; and in which shaft would he prefer for hoisting rock, &c.?

In years gone by, I have understood that vertical shafts were sunk with a view to economy in pumping and hoisting alone; lately nothing has been said. There is no room for the least contention, in my view, about a vertical shaft being the best in every respect, for pumping and hoisting at all events; but when those shafts cease going down vertical, but are sunk on the lode after it is intersected, I am persuaded it is the most costly shaft known; and as almost all shafts in Cornwall are partly vertical, and partly an incline, I consider Cornish mining companies labour under a very costly mode of both pumping and hoisting. At all events, there ought to be a very large difference in favour of the shafts started vertical for pumping and hoisting, as such work, including cross-cuts, must be very expensive, compared with sinking in the lode, to say nothing of the disadvantage of not seeing the lode while the shaft is sinking and the cross-cut drifting, and when the cross-cut strikes the lode it is only, as it were, pricked into with a pick; and as rich lodes have their poor points, and a cross-cut should strike one of them, it might produce a very unfavourable effect on the concern. In fact, instances of that kind have been known to stop the mine. Had the same money been spent in openings made in the lode, dividends might be accruing.

As I have said, "exceptions creep in in most cases;" but it appears to me there is by far too much money expended in vertical shafts and cross-cuts. I scarcely notice a report but what has something of the kind in it. Let the openings be made in the lode, and it must be a very poor one if it does not produce some mineral to assist making the explorations, while you have a daily knowledge of what the lode is like. I shall be highly pleased to see some of your correspondents take this matter in hand, and hope to find that some will do more justice to it than myself. For instance, Mr. Ennor, who, probably, has had 50, or 55, or may be 60 years experience in such matters, can, no doubt, throw on it some important light.—*Onitonagon, L.S., Dec. 12.*

A MINER.

MINING IN THE COUNTY OF YORKSHIRE—No. I.

SIR,—I beg to hand you a few remarks on some of the several lead mines now working in this famous mining district—i.e., lying between Skipton and Pateley Bridge. This district, though exceptionally rich, is in reality but little known, and that from two causes, both in favour of it: the first one being that the lead ores are not sold in the usual manner to smelters, but are melted on the mines, and then sold by the companies as pig lead; the other one is that nearly all the mines are worked by the landlords themselves, or by private parties in the neighbourhood. The situation of the mines is admirable for freedom of working. I shall first draw your attention to the famous Cockhill and Sunside Mines which are situated within three miles of Pateley Bridge railway station, and close to a village called Greenowhill, which are both inhabited with miners. These mines are in the limestone strata, and traversed by several lodes, I should say from 12 to 18 east and west, besides cross-lodes. The above property is known (according to the history of Nidderdale) to have been worked long before the Christian era. A pig of lead was found in some old workings in a hill called Coadstones, bearing the name of Julius Cesar, with several other pieces also bearing his name, which I believe are now to be seen in the York Museum, and close by is one of the champion lodes of the district, which has been for a long distance worked away to a considerable depth by the ancient miners from surface. The lode is between 4 and 5 fms. wide on surface, and the hillocks are all covered over with 2 or 3 ft. of thickness of peat. Lately a few miners and lads in the neighbourhood has taken them to pick over and dress on tribute, and are making very good wages. I called by and examined the lodestuff, which was chiefly composed, the same as most of the bearing lodes here, of barytes, crystallised spar, carbonate of lead in abundance, and solid pieces of potash ore, which weighed from 7 to 12 lbs. I may remark that if these hillocks were all removed and crushed, and a few self-acting patent jiggers, with slime-pits, &c., used, I have no doubt that a fortune might be derived from this place alone. There are also several parallel lodes within 20 fms. of the great Janet lode, which has never been touched below the surface. There is a company now formed to work the adjoining ground eastward, and resume the driving of a deep adit level in the direction of Loadstones, which is the boundary of both properties, and will, no doubt, be of great value to the Cockhill and Sunside Mines, because they will have full power to resume the driving under the old workings already mentioned, and will be about 100 fms. below surface, which will, in my opinion, make a splendid lode by itself, and will enhance the value of Cockhill and Sunside Mines. These mines were placed in the hands of the present landlord and proprietor's grandfather, with 12,000*l.* debt; he began an adit level (or a long cross-cut), discovered two new lodes, paid all the debt in six months, held the management for 50 years, and made a fortune out of the mine. During that time they paid 1-16th royalty, lead only realising 12*l.* per ton; they have been paying good profits ever since by stopping the ground above the adit level, and have several partnerships raising ore in different places, yielding on an average from 1 ton to 2 tons of ore per fathom. The royalty now is 1-12th, and lead 23*l.* per ton. Nothing has been done to prove the value of the lodes (which have been so rich, yielding several thousands of tons of ore above the level) below the adit level, beyond sinking a shaft 20 fms. deep when they were watered out, the lode being nearly 6 ft. wide, composed of gossan, barytes, spar, and a course of ore 18 in. wide. Now they have erected a steam-engine underground, 50 or 60-horse power, with a 12-in. plunger-lift, drawing-machine, &c., to drain the water, have laid lead pipes to convey fresh water to feed the engine, and will soon be ready to resume their sinking again, stope away the ore, and increase their dividends.

The next property west, which is close to the workings of the

above mines, is called Craven Moor Mines, in the same strata and on some of the above lodes. This property is 2*½* miles east and west, and about 1 mile north and south, and joined on the south by Burhill Mines, and north by North Rake Mine, and on the west by Appletrewick Mine, and the famous Duke of Devonshire's mines, called Grassington Moor Mines, which have been paying upwards of 70,000*l.* yearly profit, and the lode in the deepest part of their workings is of an immense width, containing splendid branches of lead ore, being the same range of ground as the Craven Moor Mines. Craven Moor Mines are known to have been partly worked from time to time on tribute by miners in the neighbourhood sinking small shafts from surface (upon the lodes, and no doubt large quantities of ore raised) as deep as they could with water, and all the lodes which are seen cropping to surface are of a promising appearance, such as are chiefly making large deposits of ore here in depth, chiefly composed of barytes, gossan, spar, &c.; and the same lodes in Cockhill and Sunside Mines have proved rich about 50 or 60 fms. below the deepest point yet reached in Craven Moor. These mines are now in the hands of a mine agent in the district, who has made several trials, which have already proved very successful, and are likely to make one of the best concerns in the country.

They are now sinking a shaft upon a new lode, which has not been touched in the property before. They are now down about 10 fms., and have driven 6 fms. west, and have already raised and dressed about 20 tons of lead ore, and have several tons now on surface. I am informed that the lode in the bottom is all that can be desired, being nearly 6 ft. wide, composed of barytes, crystallised spar, gossan, and a course of ore worth, on an average, 2 tons per fathom for the whole length, the minerals, &c., being alike, as the lodes generally are when close to a large deposit of ore here. They are also bringing a deep adit level from the western end of the ground towards the new workings on surface, which will be about 60 fms. deeper than the new shaft. I believe that the forebreast of the level is in a powerful lode, with a course of ore to drive upon, also being in easy and favourable ground for driving, and several other parallel lodes which may be intersected with a short cross-cut. They have made other trials, which are, as far as one may judge, likely to turn out well. I may remark that I have never seen a more promising concern (which is, in my opinion, another Van) in Yorkshire. Great activity prevails in the district, owing to discoveries made in Craven Moor Mines.

VERITAS.

N. ENNOR ON PRACTICAL MINING.

SIR,—I notice that it is generally supposed I am an enemy to practical mining men: that is not the case; they are their own enemies, through not mastering their own subjects. No man in England has ever stood his ground and fought the book-taught and theoretical men as I have done, and I have had no difficulty in keeping them at bay. I have ever said it is a matter of impossibility for any school or college to convert a "professional" into a "practical," let his abilities be what they may. A man to be a practical must go into the earth, and work a portion of his time. To know mining he must work, and observe Nature's freaks, and learn a portion of the golden laws. This to appearance is a hidden thing, and only to be learned and laid open by the expenditure of a vast amount of money, and then only by artificial lights. The formation of lodes and ores is the most complicated thing to unravel, but the day will come when a deal of these hidden secrets will be better known. The best move that I can see in the right direction is the rising home institution where the young men from the mines meet. They are mostly working miners, men of the district, with often an old stager hard by listening. This in time will certainly open some of the leaves of Nature's beautiful book. Then every one of the weekly teachers will be selected from men who have driven the wheelbarrow, and not from the schools. I ever contend that the schooling begins at the wrong end: it teaches the youth old bygone tales; they are all but imaginary, their teachers never knew the real interior laws of the earth; they teach only old imaginary tradition, selected from old books, written hundreds of years since. It is a treat to read them, to see how they disagree, and what a mess they make of it when they tell the pupils that every hill was a melting mass, and that at seven miles deep it is melting still. It is an error to teach young students to believe these vague tales. These men have told the time the first sun or world was cooling down, but I am not aware that they have given the date of the first kindling of these asserted interior fires, or what kept them up afterwards. When these students have sufficiently imbibed their theory they are sent out to teach mining youths—that is if they have thoroughly imbibed the teachers' views, if not they are neither sent out as tutors or in situations at home or abroad. The error is that these young men are educated by those who never saw the interior of the earth: they might as well open a school to teach man the interior laws and contents of the moon. I admit they stand on the earth, but they know not a single law which governs its interior. Now, the Bible goes so far as to tell us that the globe was surrounded by water, and God gathered it together, so as to leave dry land sufficient to support the earth's inhabitants. Then, I may ask them to kindly tell us when the interior fire was lit, and for what purpose?

I leave this subject for the present, and turn to the young mining practicals. I tell them the first thing they should attempt to learn is to discover from every good and productive mine they go into what causes the lodes to form masses of ore, then see if they can find a single prolific mine with neither intersections of lodes, slides, elevans, or sudden changes of strata; then see how these and the lodes meet each other. It is not every intersection that takes place in lodes which causes masses of ore to form; it is more dependent on the direction they meet each other. If they learn this they will gain knowledge. I may notice that the strata of scores of the calling mines may be good, and traces of ore may be seen to run through the lode, but they never yield massive or paying ore. Then try if he can discover whether the intersections come in at the same angle, or a different angle from what they did in the paying or productive mines; then they seldom or ever make productive mines. Young men should make themselves masters of these things, and a hundred other subjects on Nature's freaks that they discover in the interior of the earth.

Read as few theoretical books as possible, till you gather your own views, and build them on the earth's own laws, and study them well. You will feel convinced that masses of ore are only found at or near certain intersections. This will soon convince you that these intersections cause the ore to form at these points, and the ore, like all other things in creation, grows. When these things are mastered you will have learned your first lesson, and will not be easily turned from it.

Then go and hear the theoretical teachers, and read a hundred of their books, written by different authors. Then notice how they, like the priests of old, glide along in the same old path. Then see, and carefully study, the facts you have learned. Employ your time by hard work in the earth, your natural book. The best site to gain mining knowledge for the next century is in the earth, as it is not to be learnt in professors' schools—they only polish.

One great drawback to young practicals are the first rudiments of education. These he is now bound to get under the new school law. A few weeks since, when riding in a van, I fell in with an intelligent young man. No one could tell me who he was. I soon discovered he was studying mining laws. I am not aware that he ever wrought as a practical in any mine. I rather thought he was school taught; but he is in a very fair way to get on. I since discovered that he was a mine school teacher, and was on his way to a small mining town to teach young miners, a very good move. Next, turning to mine reporters, I argue they should be good practicals. Some may say their name is legion. I am aware that there are many so-called practicals, and they, like most other trades or callings, can do a fair day's work in a day, but the majority of them can only be classed as good day labourers as miners: the only thing they study is how and where to get the most money—they soar no higher.

Then comes another class of men—men who never wish to meet a hard day's work. They use every means to avoid it; they often pretend that they are ill, or tell any lie to avoid work; they endeavour to lure their comrades to the beershop, instead of going to

work, and particularly if they are in the night shift, and can shun the captain. These are a dangerous class; they will tell any lie as to the prospects of a mine, and particularly so if it is under water. They make unwary men believe what they say is truth; they often get them to work old poor mines, where a great many of them get in as agents, but they seldom get a paying mine. These men never study a single law of Nature, they never attempt to open a leaf of that book—a book that contains only golden rules. When they get in as mine agents they are very pompous and consequential, and naturally lazy. Not one in fifty of them knows what the ore they raise is mineralised with, what produced it in the lode, or whether it was formed there at the day of the earth's creation or has grown since. It is through these men that so many call-paying mines are now at work. These men know not when to stop worthless mines. Many men, and even adventurers, suppose and say that these call-paying mines should be wrought in order to keep up the dividend-paying ones, but I say not half of these mines have a single chance of ever becoming paying ones. It is here we make the great mistake; not one in twenty will ever pay outlay and interest of money. I know a Cornishman, one who gives good statistical accounts, who often tries to prove that mining pays a very high percentage; but he, some time since, let it slip out that the average of mining pays 3*l.* out to get 1*l.* back. But I now throw down the gauntlet against any man to show that the calls at this time are not 50*l.* paid out to 1*l.* return. See the Dividend List: it is a mere farce as to the mines that stand in that list as dividend-paying ones. There are fifty odd for the two western counties; then, who will show me that four of them pay dividends over the interest of the money the shares are purchased for. Then, the call list shows 110 mines; in that case we may say that the Cornish and Devonshire mining days are over—that is, so far as profitable mining goes. Then, what caused it? Are the captains making bad selections, or badly managing the mines? I say it is both.

Then come the shareholder and mine promoter, bringing out mines with 60,000*l.* and 100,000*l.* called up capital; many of them old mines which I have inspected, and that, I say, have not one chance in twenty to become paying mines, even if brought out at only 20,000*l.* Then they, to raise the wind and get the 100,000*l.* paid in, go so far as to change agents, and pay dividends out of the paid-up capital. It will only surprise me if the outstanding shareholders ever get a copper of their money returned. It serves them right; here are the two classes met—the knave and the fool. I need not ask which will win. I may further remark that Cornish mining is now at the turning point. It must either reform or collapse. I say to those owning mines paying calls, throw up the majority of your shares, and sell quietly out of your dividend-paying ones, when shares will drop to a fair price. You may say this will be ruinous: then I say hold on, and lose all.

With your permission, Sir, I shall continue this, as I have not yet noticed the better class of captains, or how the professors lied.

N. ENNOR.

MINING, AND MINING ENTERPRISE—No. II.

SIR,—A review of the financial history of the past year indicates great strength and elasticity in the material growth of creative wealth, which add greatly to the prospective resources of the community. This stability and healthy state of trade, commerce, and manufactures has been developed, to use a graphic expression of the Premier's, through energy, enterprise, and good luck, not by "steps," but by "leaps and bounds," and although from foreign and exceptional causes we have had no fewer than 24 changes in the *minimum* Bank rate of interest, varying from 3 up to 9 per cent., we have, happily, had to contend against few commercial and financial disasters. There are only rare instances of grief to record during the year in banking circles, manufacturing centres, or in the industrial fields that find employment and sustenance for the masses. Wages have been fair—high in many instances—and despite the increased value of the necessities of life, both the material and social comforts of the people exhibit amelioration and enhanced prosperity.

During the last year new companies have been brought out representing 60,000,000*l.* in the aggregate, and of which 13,400,000*l.* has been called up, while companies previously created have sent into the market no less than 36,000,000*l.* additional capital, and succeeded in obtaining no less a sum than 23,376,200*l.* Foreign loans to the extent of 128,000,000*l.* have been floated, and payments of 84,662,000*l.* responded to. Thus making in these three directions a total investment of 121,942,200*l.*, with further liabilities of 102,057,800*l.* for the money market to find during the year 1874. All this investment of capital has taken place without the slightest mania for feverish and reckless speculation, and in spite of the continued and startling warnings afforded by Austria, America, and other countries, with the still keenly felt and crippling panic that culminated in 1866-7. France has paid to Germany the war indemnity. This speaks volumes in favour of the recuperative powers of France, and the immense sum transferred will enable Germany in the course of ten years to substitute a gold for a silver currency. The Bengal famine is a visitation of Providence, but the Ashanti war was aimless, and operations on the Gold Coast are most tantalising and irritating to that generous and most complaisant and indulgent old gentleman "of conservative proclivities"—John Bull. Under normal circumstances the promise of 1874 is cheerful and healthy. Is it not, therefore, most provoking that the prospect should be dimmed by the weakness of Mr. Gladstone's administration, and the untoward external events to which we have referred?

In speculative enterprise we have to record very satisfactory progress in British mines for the year 1873:—Van declared dividends of 7*½* per cent.; Doleath of 30 per cent.; East Pool of 7*½* per cent.; South Caradon of 1000 per cent.; Bampfylde of 20 per cent.; Roman Gravels of 3*½* per cent.; Minera of 25 per cent.; Great Laxey of 3*½* per cent.; Carn Brea, 17 1*½* per cent.; Lowell, 80 per cent.; Tincroft, 39 per cent. The half-yearly dividend of the London and Westminster Bank will be 12 per cent., making 24 per cent. for the year, against 20 per cent. for 1872. Union Bank of London 7*½* per cent., and 2*½* per cent. bonus for the half-year, equal to 20 per cent. annually. This dividend is on the increased capital, yet the balance carried forward is reduced from 51,125*l.* to 20,815*l.* The Alliance will pay 8 per cent. annually, and the Metropolitan at the rate of 7 per cent. The National Discount Company 15 per cent. annually. The philosophy of opposition is most apparent, and while we admit that "the ways" of Providence are most inscrutable, we cannot but wonder that man in the height of his power and usefulness refuses to advance or to receive amelioration, divorced, from opposition. Nor is this opposition devoid of philosophy. The chick becomes an opponent the very minute it becomes hatched; the infant struggles for nourishment, and feeds on its mother; the rivulet is absorbed in the stream, the stream in the river, and the river in the ocean. Contention and opposition are the elements of animal and creative life, while the laws of gravitation effectively "oppose" the world's excision. Opposition is manifest in every grade and position in life. Its philosophy is admitted in the senate, the bar, the church; commerce, trade, and agriculture; the professions, the aristocrat, and the plebeian are alike imbued with its spirit, while progress is effected and sustained through its practical philosophy. But in no department of the world's industries is its birth, existence, and philosophy so evidently conspicuous, and practical, as in that of mining. Who so patient, industrious, and persevering under hopes deferred as the miner? Who opposes difficulties, disasters, and defeats with philosophy equally with the miner? The philosophy of opposition is on all sides not only apparent but universally acknowledged. On the day that Galileo died Newton was born, yet the former was brought to his knees at the age of 74 before the Inquisition, while the latter required the pen of Voltaire to record his fame. Railways and telegraphs were signally opposed; in the phalanx of contention are seen members of both Houses of the Legislature, statesmen and ministers, lawyers, divines, and laymen, with landlords and tenants, canals, carriers, and demagogues of every kind and character, yet the present generation could not exist without the use and locomotion of the former; nor could the commerce and social intercourse of the community be sustained without the latter. The reformation in "postage" was not effected without opposition; still, the whole world acknowledges the boon.

The Imperial revenue is advantaged, while the community is raised intellectually and socially, not only in mental culture and interchange of thought, but likewise domestic ties and relations are strengthened, "for distance constitutes no barrier" with the varied and ramified transactions of trade, commerce, and diversified business.

Who descends the shaft, opens the veins, and risks his labour, nay, even his existence, with equal fortitude, and cheerful alacrity, with the industrious and speculative miner? And who rejoices with such hearty, self-acquired, and honest satisfaction as the enterprising miner when success attends his labours? No chirp of Nature's plumage is half so cheerful. No heart throbs with more healthy delight, nor pulse beat with greater strength and power than the miner when his efforts discover the hidden chamber of wealth. He knows that its riches will reward his master, give increased stimulus to labour, add comforts and cheerfulness to the community of which he is a member, increase the volume of employment, of commerce, trade, and manufacture. The discovery of a good and profitable vein of ore not only enriches the owner and swells the nation's wealth, but it likewise stimulates enterprise, and encourages the desponding to fresh and renovated struggles for success. Herein is to be seen the philosophy of opposition, and probably at no other period, and in no other case, has opposition been so conspicuous, determined, and prolonged as in that of New Great Consols, nor its philosophy been so evident and recuperative as in the results achieved through the skill and practical joint management of Messrs. Phillips and Pryor. Still these gentlemen, satisfactory as their products already have become, would do well to carry their investigations yet further, for if we do not greatly err the ores contain, in addition to tin and arsenic, about 2 per cent. of copper and 15 per cent. of iron. Could not these be extracted and utilised, and do not the amalgamate when raised to the surface contain sulphuric and muriatic acid in sufficient quantities, easily extracted, to collect the copper, and with very slight additional cost? This, we admit, is more a chemical than a mining question, but our attention has been directed to the subject, and we have lately been present when intelligent authorities have discussed the feasibility of separation and collection, with confident anticipations of favourable results.

The amalgamation of New Consols and West Great Consols is now practically effected, under the title of New Great Consols (Limited), with a capital of 95,000*l.*, in 3*l.* shares. After incurring the heavy outlay in machinery and plant, making the dressing-floors, surface buildings, and other workings there remains in hand a large surplus. The introduction of this gigantic and valuable property to the notice of London capitalists will do good; it is chiefly due to the intelligence and energy of Captain Richard Pryor, whose experience with tin mining and tin dressing (two widely different qualifications) is most extended and varied, and whenever happily combined in the same person of double value to those who possess such services.

The New Great Consols was started under adverse pressure on the management, not only from the tenants, who apprehended danger to their crops, through the escape of arsenic, but also from the local agents, who ridiculed the appliances in the manipulations of the ores and improvements introduced in the dressing and separation of the amalgamated ingredients, yet all of them are now established to possess an independent and commercial value. It is a fact of graphic significance that 650 tons of ores, averaging 70*l.* a ton, have been brought to market, in addition to about 4000 tons of arsenic, worth (at present) 85*s.* a ton, (say) together 62,500*l.*, or on an average of 25,000*l.* annually since the starting of the steam-stamp—in the first instance, 35 heads (since increased to 60), about 2*1/2* years ago. The chief attractions of this property consist in the facilities with which the products can be wrought, rendered marketable, and realised with advantage. At present the operations are restricted to the lode on which Phillips's engine-shaft is sunk to the 86 fathom level, or about 90 fathoms from surface—the conformation of the surface being all but a level and standing in the killas at the base of the granite that constitute the Kit and other hills, add additional interest to the New Great Consols property, as under very similar circumstances the Dolcoath, Cook's Kitchen, Tineroft, and Carn Brea, with East Pool, the Tolguses, North and South Crofty, and West Seton became great, important, and vastly remunerative enterprises at the base of the hills, and in and out of the junctions of the granite and killas bearing on the hills extending from Camborne through Illogan.

There are additional attractions in the compass of the company's grant—two other tin-bearing lodes standing to the south of Phillips's engine-shaft; upon one considerable shallow explorations have been made for copper, yet a close inspection of these workings show the existence of tin, and that, too, in unusually paying quantities. Still, time is necessary, and also moderate outlay, to render the lode of commercial value, yet the results may be equal to those already achieved on Phillips's vein; at its extreme depth Phillips's lode is free from arsenic, more compact in character, exhibits more defined indications of tin-bearing qualities than in the shallower levels, and is worth at least 200*l.* per fathom for that ore alone. Its strength is significant of continuance in length and depth, while the mass of ores already in sight will supply the dressing-floors with work for many years to come. The second lode also contains tin, and is comparatively wholly undeveloped. This, as well as the others referred to, can be commanded by cross-cuts down to the depth of the workings on Phillips's lode. The pumping for drainage, with drawing power, being equal, with slight additions, to commanding the three. Just a mile and a half to the east stands the Devon Great Consols, which has yielded 1,100,000*l.* on 102*l.* outlay. This lode is discovered in the northern part of the company's grant, and found at a depth of 2 fms. only from surface a compact quartz, crystallised, iron gossan lode, 10 ft. wide, identical in character and promise with its rich compeer. Trial shafts have been sunk on its course, and wherever intersected the component parts show the same features. Up to this time the lode is wholly unexplored in depth, and, regarded in a commercial view, the distance apart is ample to gather other rich deposits of copper ores, while the presence of an elvan course speaks volumes. The workings being so shallow only one drawing and winding engine of 24-in. cylinder is erected, but this will effect the work for years to come. In stamping a 36-in. cylinder is at work with 60 heads; capable of 36 additional being added, or, if required, 60. A Blake's stone-breaker of the most powerful description is at work, and utilises labour to at least 50*l.* to 75*l.* monthly, and the management fully recognises its advantages. There has been much discussion in respect to Brunton's Revolving Patent Calciners, but in respect to their superiority they are greatly opposed and questioned by resident manufacturers—i.e., the weight of metal and economy in construction create opposition; yet in the face of this fatuous controversy Capt. Pryor has already erected seven, and these unquestionably attest the importance, economy and practical utility of his views. The floors are complete, and require only a visit to realise their power and efficiency. The ordinary burning-house appliances are unique in construction, with every regard to economy of labour. This principle has been carried out in detail throughout the whole paraphernalia of dressing and rendering marketable the tin and arsenic. The agents of the Duke of Cornwall pronounce them, we are informed, the most efficient throughout the Duchy. The result of these special appliances of Capt. Pryor is a product of about 550*l.* monthly in arsenic, which otherwise would become lessened and commercially less valuable. These active machines of economy stand boldly forth as a recompence to Messrs. Phillips and Pryor for fearless disregard of every opposition and the conflicting interests of all otherwise than adventurers. There is already erected and brought into action the subjoined powerful field of machinery and plant:—One 80-in. pumping-engine, with 19-in. pitwork fixed to the 86; a second 50-in., and for drainage these are equal to commanding the three tin and the Devon Great Consols lodes to a depth of fully 200 fathoms, which they will not attain for the next fifty years.

As announced by us, the Llanrwst has become an acknowledged success. At the statutory meeting a general feeling of confidence was expressed in favour of the board and local management. Capt. Knapp not only confirmed all his previous reports, but volunteered to rest his reputation on results practically exceeding his calculations. He referred with earnest confidence to his career in connection latterly with South Caradon, and for a series of years to the Wheal Wrey, Mary Ann, Trelawny, and Ludcott, as instances of his

careful reporting, while he trusted that all who entertained doubts would send their agents to inspect the workings.

At Bampfylde the yield continues satisfactory, while the reserves of ores, iron, copper and manganese now in stock are respectively 9000, 200, and 160 tons, and the future supplies are represented as likely to augment. These ores, through the completion of the tramway, will soon be brought to market. There has been a fusion of strength introduced into the proprietary of East Balleswidden Mine, and it is highly probable that the shares will become in active demand.—32, Fleet-street, Jan. 7. TREDINICK AND CO., Mining Engineers, and Dealers in Stocks and Shares.

CORNISH MINE MANAGEMENT.

SIR.—Referring to the letter signed "Lex," in last week's Journal, calling in question the propriety of Capts. Goldsworthy and Skewis having the management of so many mines, did it not strike your readers that they, having obtained a reputation by their skill, diligence, and trustworthiness, have justly earned the reward they are now reaping; and, on the other hand, that mining companies feel safer in the hands of such men than in the hands of some "would-be managers." As to Capt. Goldsworthy I have not much knowledge, but from what I have heard I do not wonder at his having so many mines under his control. As to Capt. Skewis I have a pretty good knowledge of his abilities, and I have no hesitation in saying that in none of the mines mentioned is there any real complaint as to neglect of duty or incompetency. Though that gentleman may not visit a mine more than two or three times a month, he has the good fortune to be served with thoroughly good resident agents; such men as Capts. Dunstan, Prowse, Seccombe, and Brenton cannot be picked up anywhere, and Capt. Skewis has shown the genius of a general in selecting his men. There is one thing distant shareholders like—to be kept out of the Stannary Court, and in having Capt. Skewis they feel pretty safe on that head; in fact, in the matter of "after calls" the management of Capt. Skewis is almost equal to a register under the Limited Act. While shareholders feel this they will not be likely to allow their mines to be managed by any body. The name "Lex" would seem to indicate that the writer belongs to another profession, yet I am not sure that he is not one who would uncommonly like to manage one or two of those mines. If he could only convince any of the companies of his great merits what a fine thing it would be for him, but "there is the rub."

SHAREHOLDER IN FOUR OF THE MINES MENTIONED.

MINERS' CONVERSATIONS—No. XI.

Bill.—What is your opinion of the "strikes" amongst the colliers in South Wales and other places?

John.—I consider them great evils. A strike can be justified only on the ground of a just complaint against the employers which could not be otherwise redressed. In the beginning of the strikes there might be some reason in demanding an increase of pay, and a little diminution of hours of labour, which were conceded, but the miners who assumed the position of dictators have been pushing forward their demands to an iniquitous extent. It appears that they are never satisfied with any concession. It would serve them right if the Cornish miners supplanted them all. I mean by taking their places at the mines, as has been done in a mine or two. The employer and the employed are mutually dependent, but "reason should rule." The miners who went from Cornwall to the coal mines earn double the wages they got at home.

Bill.—The miners of Cornwall have not followed the colliers in their strikes: how do you account for that?

John.—On the ground of their good conduct and reasonable nature. Those who have obtained their object—increased wages and less hours—have shown their dishonesty by doing less work than they did before. But their unrighteousness will bring upon them retribution.

Bill.—In what way?

John.—Ultimate diminution of wages, probably below the old scale.

Bill.—How can you show that?

John.—The high price of coal, consequent on the strikes and their results, has stimulated the industry of other countries to increase very largely their production of coal, and which has already led to a decrease in our exportation of the article. This will lead, I suppose, to an importation of coal into England, which will most surely bring down the price both of coal and labour at home. The present may be regarded as an artificial price, bearing heavily on the mines and the poor.

Bill.—I have read that the increase in the colliers' pay has done them no good, for instead of taking the money home to their families they have spent it in publichouses.

John.—That is true, and is another proof of the badness of their character. The innkeepers and beer shopkeepers have been the real gainers by the strikes—men who live upon the sinful, sensual propensities of mankind.

Bill.—I see that the *Mining Journal* has a letter or two every week about the four and five weeks month. What is your opinion as to the utility of the change which has been made in some mines by the adoption of a rule to pay every four weeks?

John.—Although willing to have my pay as early as I can, I consider the change of very little value to the miners, and of great inconvenience to the mining companies who have adopted it.

Bill.—How can that be?

John.—You know that a five-weeks month comes only once a quarter. That man must be a very bad manager of his gettings not to provide for the fifth week four times a year. It has been proved that as regards the amount paid in such mines there is very little difference in the wages. The men have much the same as they had before the change. Most mines are too poor to admit of much increase to men's wages, everything required by mines being so dear. If men who are so short of cash as to require an advance from the purser for the fifth week they can have subsist by asking for it. I know that Captain Pryor expressed his readiness to advance money in his mines in such cases.

Bill.—But what inconvenience can result to the adventurers from the change?

John.—You know that there is no thirteenth month in our calendar. The year comprises only twelve months—January to December, both inclusive. Therefore the four-weeks accounts cannot be brought within these long-recognised periods, and yet they do so nominally, leaving, I suppose, the thirteenth four weeks to be charged at the year's end. So that January or December month's cost, so called, in the cost-book is not really all the cost of the month, but only 28-31sts of the cost. I believe that the mining companies will either return to the old calendar-monthly payments, or pay the men weekly.

Bill.—The class of labourers who, of all in the country, could reasonably "strike" is that of farm labourers. No men were so badly paid as they, nor any who so quietly endured their yoke. And yet it was a long time before they moved for an increase, and that in very few places. Their case was considered, and their wages raised from about 9*s.* or 10*s.* per week to 14*s.* or 16*s.*! In addition to which they have, in some places, a cottage and garden, and, perhaps, a place wherein to rear a pig.

John.—And what a slight pay, after all, that is for a man, his wife, and children! But it is nearly as much as railway porters receive. That is another class of men shamefully paid, and yet they are forbidden the acceptance of any gratuity from a passenger! The postmen's is the third class of badly paid servants. Their salary is even worse, I believe, than that of the porters on railways!

Bill.—I was glad to hear a few days ago that an improvement has taken place in Crenver and Abraham Mines.

John.—So was I; and I hope that it will lead to a rich deposit, sufficient to repay the company all their outlay, with good profits beyond that. I saw a letter in the Journal two or three months ago, expressing an opinion that the lode should be tried deeper.

Bill.—That is what they are doing. I am very glad that Messrs. Willyams and Co., the bankers, are to have the balance of the purchase-money which the company agreed to pay for this mine; but the directors, after paying 28,000*l.* out of 30,000*l.*, tried upon a point of law to evade the payment of the balance, but the judges have decided that the balance must be paid.

John.—It looked much like a trick to evade the payment of a

just claim. You may call such men honest if you please; have my opinion respecting them.

Bill.—Is it true that Captain J. Thomas condemned Cremar and Abraham?

John.—Yes; but you know that Capt. Thomas, although a very nice man as a master and neighbour, was never a practical man like ourselves, so that I don't think him qualified to give an opinion on a mine like one who has had great experience, like Capt. Tregay, who reported favourably on the mine. Anyone can manage a rich mine like Dolcoath, but Capt. Josiah never discovered a good mine. The manager of New Great Consols is the man for finding good mines, and for knowing how to report correctly on any.

St. Just, Dec. 30.

AGENT.

LEGITIMATE MINING.

SIR.—In my former letters of this series I endeavoured to direct your attention to the fact that the word "legitimate" as much as forcibly applies to the judgment of men as exercised in the selection of mines, and the motives by which their purchase is induced, as it does to the choice of means and the general conduct of the agents employed to develop them. Mining differs in this respect from almost every other pursuit. It would be a palpable waste of superior skill in the arts to bestow it upon objects which consisted of an inferior material, as the natural inferiority of such objects would assert itself in defiance of the best workmanship which might be applied to its dressing (unless the texture of the material was effectually concealed by some artificial surrounding), and create such a disparity between the real value of the material and the decorative art applied to its adornment as would only increase in proportion as the contrast was intensified. But not so in mining, as superior skill, practically exercised on legitimate principles, whenever and wherever applied, must always be in harmony with its effects, and, *vice versa*, its effects with it. But no subsequent exercise of practical skill can ever counteract the consequential effects of errors committed in the selection of inferior mines, especially when such are recommended to the public as first-class channels of investment. Nor can it ever counterbalance the difference which will arise, and continue to repeat itself, in respect to the rates of purchase, as the relation between invested capital and the accruing interest is a self-asserting and continually repeating issue. The evil effects of buying mines at double their value do not end in a diminished interest upon the capital invested, but extends itself into the arena of their practical operations, and by unduly taxing their resources limit and weaken the channels of productiveness, a *regime* which has been found but too fatal to many mines. If in the early stages of mining the exploratory operations are not largely in excess of the scale upon which the extraction of ores is carried on, a forced and unnatural condition of things must prevail, which always, sooner or later, brings its own punishment—sooner in a majority of instances is the rule; and such a course operates with very damaging effects not only upon individual adventures, but against the general interests of mining. To wrench from the best of mines a given quantity of ores to the fullest extent of their capacity in a given time would be to institute a measure which, in proportion to the fidelity of its observance, would be its tendency to lessen and deteriorate the channels and sources of its own prosperity. When the awful fiat goes forth "It must be done," "There is no help for it," "It is imperatively called for by the situation," "No one is responsible for events which could not by possibility have been foreseen, and arising from circumstances over which no one has any control,"—it is needless to say that this is a juncture which portends the sacrifice of natural valuable channels of wealth to individual caprice or cupidity. Many a good mine, and especially American mines, has been sacrificed in this way, and whilst no one is said to be responsible for such unfortunate occurrences it is generally easy to trace the evil to its source, and latterly to find in a large number of cases that it originated in a circle beyond the sphere in which the executive moved, and over which the members of that department had not the least control. The suitable and timely adaptation of means to an end is an important part of legitimate mining, whether practically or commercially considered, and is that which conduces as largely to its success as any differences which are usually found in the natural channels are capable of producing.

With regard to the practical part of mining there are also two divisions. One respects the general outline, the other the multifarious detail. The general outline of a mine is usually methodically arranged in agreement with sundry ideas of objects and ascertained facts known or reasonably assumed to be comprised within certain defined limits of ground proposed to be submitted to experimentation, their qualities and other leading features being taken into account. And here the term legitimate, according to the definition we have given of it, beautifully applies. The arrangement of means to an end, according to an ascertained outline of natural objects which are intended for a costly and protracted development—mostly concealed but partly revealing themselves—is of vast importance, as the means usually resorted to in this division of mining are of that character which increasingly extend themselves, and become continually more expensive, expanding fixtures, and which, if wrongly planned, must either result in a partial or a total failure. It hence becomes apparent that in proportion to the accuracy with which the primary objects are apprehended will, in all probability, be the adaptation and efficiency of the means employed for their investigation and development, each of which, either separately or combined, form not only integral parts, but become auxiliaries of whatever success may be achieved. If an ill devised and incongruous plan be put into execution, one not fitted to operate naturally, such a want of harmony will conduce to disorder, and not only tend to retard the general progress, but to increase the expenses.

The practical operations in mining may be so awkwardly arranged that 50 to 100, or more, per cent., both in money and time, may be required to accomplish a similar amount of effective work than if they had been more consistently and methodically arranged. On the eligibility of the site which may be selected for an engine-shaft sometimes depends the success of a mine, and not unfrequently the measure of such success to an extent scarcely credible, and hence it becomes necessary to institute the most thorough superficial examination of the entire area of a mineral grant, or, at least, as much of it as can conveniently be commanded by each leading shaft as a working centre, and all the prominent features of which should be constantly kept in view, so that all changes arising from the various intersections, whether of the lodes themselves intersecting each other, or their being intersected by slides, cross-courses, or elvans, in order that the probable effects of such occurrences may be looked for in advance, so as to avoid disappointment on the one hand, and undue excitement on the other. Enthusiasm will always be stimulated by such occurrences, whatever precautionary measures may be adopted. Whatever they portend, whether favourable or otherwise, there is an incentive to anxiety, stimulated by certain clearly outlined expectations. To compass ends most effectively by the cheapest and quickest means, provided the objects are sufficiently comprehensive and understood, comprises all that is included in the term "legitimate" in its application to practical mining, whether relating to the general outline or its no less important detail. To particularise the detail of mining, or to criticise the methods employed in such detail individually, would be an almost endless task, and one sufficiently embarrassing to tax higher attributes than those possessed by men. It is only a few general remarks which anyone can venture to hazard on such subjects, as the testimony of individual experience is so widely conflicting. Such a state of things may arise from—to ordinary observers—imperceptible shades of difference pertaining to different mines and to different circumstances regarding them, which in the aggregate might suffice to constitute a decided peculiarity, and require, to be successfully met, an extensive modification of the ordinary appliances. Or, in case the mechanical arrangements should be of the most approved and efficient character, the skill and judgment displayed in their operation may be faulty in a very marked degree, and in consequence of which very indifferent, if any, success at all will be achieved.

Market operations, too, sometimes oppose themselves to legitimate mining. When these interests are made paramount they necessarily oppose themselves to legitimate progress, as the means employed to consummate individual objects are just those which

essentially damage the mining interests, and in proportion as measures are devised to such an end and put in practice will be the sacrifice of general personal interests.

ROBERT KNAPP.

Llanrwst, Dec. 30.

NEW GREAT CONSOLS MINE.

SIR.—By the kind permission of Mr. Phillips, of St. Michael's House, Cornhill, I went thoroughly through this mine a few days ago, accompanied by Capts. Pryor and Bennett. Those gentlemen were exceedingly attentive, and pointed out every possible thing to my view. We went straight to the bottom of the mine, which is 86 fms. under the adit level. At this point I will try to describe the leading features. The engine-shaft is sinking under the 86, and is down some few feet, in a lode of great value; I would say for the part of the lode carried fully 150^l. a fathom. The lode at the 80 has been entirely cut through, and is 36 feet wide. I had the lode chipped throughout the width, and it is of precisely the same character as the bottom of the shaft. Samples from the entire workings at this level I have had assayed by the best men in Cornwall, and the result is an average of 1 cwt. 1 qr. of black tin to the ton of stuff, and this for over 30 ft. in width. This level has been opened on some 20 fms., and is of precisely the same nature and value. The shaft is to be sunk to the 96, and when opened on here there will be no necessity to sink another foot for 20 years. I consider standing above the 74 there are some hundreds of thousands of tons of tinstuff of superior quality, more than can be taken away in 30 years, and is of itself sufficient to keep going 250 heads of stamps for that period, and would return quite 80 tons of black tin per month for the time stated. I may say that in about one year from this date you will be enabled to employ 250 men underground, and all profitably—in fact, every man should break his 30^l. worth of tinstuff monthly. I would say let every man that has a desire to see a tin mine of magnitude go and look at New Great Consols.

The surface works are laid out on the latest improvements in tin dressing, and cover a very large space. The machinery for pumping is all that can be wished for, and the water is all at the bottom of the mine. From the 74 upwards scarcely a drop of water is to be seen. The company should immediately put up 150 heads of stamps more, and I have no hesitation in saying that New Great Consols would then make the largest return of tin of any mine in Cornwall. I might say a great deal on some side lodes standing entirely in virgin ground, but those I will leave for another visit.

G. W.

EAST WHEAL LOVELL.

SIR.—This mine again bids fair to become notorious. To my great surprise, last week I received a notice of meeting to be held on Dec. 31, "to audit the accounts and make a call." Still more surprised am I to see in the Journal of to-day that the large sum of 30s. per share has been called to discharge liabilities. Now, I beg to refer you to the report of March 31 last. "Balance against the mine, 171^l. 7s. 1d." Agent's report—"Our prospects are most encouraging, and we shall make profits in future." Up to the following meeting every week's report showed an improvement in the mine, and when the meeting was held, on Aug. 29, the lode had improved from 240^l. to 300^l. per fathom, and a profit (?) of 213^l. 11s. 1d. was shown by charging four months' costs against five months' returns.

Now, Sir, I feel sure you will help us poor London shareholders to put a stop to the present mode of managing this mine. Were such statements as the following ever sent out? They are exact copies:—

EAST WHEAL LOVELL.—March 31, 1873.

Dr.—1872. Sept. 16.	Balance of account held this day	£1980 12 8
December.	Labour cost	1486 18 10
	Merchants' bills	1156 7 1
	Dues	145 19 3
	Total	£4759 17 10

Cr.—1872. Sept. 16.	Call on 1906 shares, at 1 ^l . per share	£1906 0 0
	Tin sold, 32 t. 14 c. 2 qrs. 13 lbs.....	2692 10 9
	Balance	171 7 1
	Total	£4769 17 10

1873. March 31.—To balance

Not one word as to assets or liabilities—not even the day of the month in December to which the costs were brought up. Per contra, no discount taken off call. I know there was some, for I had 5 percent. off mine. Therefore the above account cannot be correct. Here is the next account:—

EAST WHEAL LOVELL.—August 29, 1873.

Dr.—1873. March 31.	Balance of account held this day	£ 171 7 1
Feb. 1.	Labour cost	£285 17 10
March 1.	Ditto	295 10 5
March 29.	Ditto	285 8 5
April 26.	Ditto	286 5 0=1150 1 8
	Bills, dues, &c.	1201 6 6
	Balance	42 4 9
	Total	£2565 0 0

Cr.—1873. Tin sold, 27 t. 12 c. 2 qrs. 9 lbs.....	£2004 9 2	
Tin ready for sale but not sold	500 0 0	
Materials	0 10 10	
	Total	£2565 0 0

Again, you see no word of assets or liabilities. Bills, dues, &c., 1201^l. 6s. 6d., lumped together in one line. Tin sold, 2047^l. 9s. 2d.—no date or rates given. I have not seen the present statement, nor does it appear in the Journal. I suppose it will be on the same principle. Surely the time has now come for some action to be taken. Everyone I come across seems afraid of the purser, but he is, I believe, only a small holder of shares, not above 50, while some of our London men hold more. If another management were to have the mine I believe the shares would go back to what they were when I bought (20%), and not be unsaleable as they are at present. I do not complain of the call being made to wipe off all liabilities, indeed, I approve of it, as I always strongly urge all costs being charged up to the latest moment, but what I do complain of is being kept in the dark as to whether costs are charged up, and then instead of a dividend a heavy call made. Let us shareholders insist upon the next meeting being held in London, and so break up the present system of management.

A HOLDER OF 25 SHARES.

London, Jan. 3.

FORTESCUE TIN MINE—ITS HISTORY AND POSITION.

SIR.—This mineral property is situate in the parish of St. Stephens by St. Austell, in Cornwall. The numerous extensive excavations of great antiquity within the sett were probably made by the Phoenicians and Jews. Norden observes—"Former times, as it seemeth, have not been ignorant of the benefit of their Cornish tinworks, and the antients have not been idle in the search of them." This observation, of course, applies to all the districts in the county in which such ancient works were found, as Gwennap, Breage, Cowan, St. Just, Wendron, St. Stephen's, St. Agnes, &c. It is remarkable that the antients, usually termed by the miners "old men," worked on the backs of nearly all the tin lodes in Cornwall and Devon at present known; and in nearly all cases the resumption of operations on them have been successful, Great Wheal Vor, Great Work, Parka Mine, Polgoon, &c., to wit.

Because St. Stephens is not in the great centre of the mining industry of Cornwall (Camborne, Illogan, Redruth, and Gwennap), that attention which it clearly deserves has not been given to it, although not far to the east thereof the old Polgoon Mine was worked for a very long period with great success. Near still, and only ½ mile eastward of Fortescue, stands Great Hewas Mine, which has yielded immense quantities of tin.

Fortescue Mine is in the land of the Hon. Mr. Fortescue, and is held for a term of 21 years, at reasonable dues. During the last century miners from time to time have worked on the lodes as deep as they could go without the aid of machinery—carving the tinstone long distances to be stamped, and which paid them well. In 1870 several miners had possession of the mine, from whom, in 1869, it became the property of two gentlemen, who cleared some old works and raised therefrom about 1000^l. worth of tin, but to vigorously work the mine the present company was formed. The two gentlemen referred to still hold a large interest in the property—one-sixth part. The capital of the company is 20,000^l. in shares of 1^l, each, 17,000 of which have been called-up.

In April, 1872, the company took possession. About that time heavy rain set in, and continued with little intermission for several months, which greatly retarded the progress of the surface operations, which, with several unforeseen and unanticipated circumstances, prevented the completion of the buildings, &c., by the time originally contemplated. However, at the present time every necessary appliance is complete for reducing and dressing the tinstone, including a steam-engine driving 24 heads of stamps, a calciner, &c. The calcining commenced this week; monthly sales will commence in a few days. Great praise is due to Mr. J. H. James, the managing director, for the manner in which he has conducted the company's affairs at the mine from the first.

Some extremely interesting discoveries have been recently made in one of the very old workings. Here tin ore ground of considerable extent has been laid open, far surpassing in richness the renowned Mulberry Hill. At this point the lodes present several intersections, from which radiate several lodes of tin, forming an extensive area of tin ground. Rich specimens of the ore have been sent to the office in London.

One of the obstacles to the company's early prosperity has been of a pecuniary character. Owing to the deficiency of capital originally paid-up, the directors had to issue some of the shares at a great discount, hence the low quoted value of the shares; but now that monthly sales are about to commence the shares will, without doubt, very soon increase rapidly in value.

The following notice appears in a contemporary:—"We are glad to find that the claim against this promising mine, for which a petition was presented by J. J. Derry, of St. Austell, has been paid. We hear that monthly sales of the will now take place, considerably more than sufficient to pay the expenses of the mine, and we congratulate the shareholders on the success of the undertaking. Great praise

is due to the managing director for the manner in which he has laid out the plant, and the great energy he has displayed from the commencement of the works in bringing the mine to what it is.

A MINE SHAREHOLDER.
St. Austell, Dec. 21.

ROOKHOPE VALLEY, AND WILLOUGHBY MINES.

SIR.—I am glad to think "A Subcriber" has written for information respecting the first-mentioned mine. At the time it was introduced to the public, about two years ago, it was brought out with a great flourish by gentlemen who held a high position in the mining world. If my memory serves me, Capt. Waters' report mentioned there were three mines in the sett, containing lead, iron, and coal, and that the adjoining mines, belonging to the same parties, had, for nearly a century, returned them something like an income of 40,000^l. per annum. Such being the case, the public were induced, from that report, and from the influential names attached to the prospectus, to take shares in the same. That in the course of a few days after the company had been launched the shares were at a premium of 32^l. I, unfortunately, was one of those who paid 50s. premium, and the present price of the shares is about 15s. each. Can any reader solve the problem why they were worth 6d. 10s. per share two years ago, when the property was in a state of chaos, and now that the mine is producing from 25 to 30 tons of lead ore monthly, independent of blonde, with the report from the captain that it will shortly be returning triple that amount, and will soon be in a dividend state, that the shares should be almost valueless, and in the face of lead being 30 per cent. higher in value than it was two years ago?

Take, again, the Willoughby Mine, which was brought out about the same time as the Rookhope Valley, and supposed to be a second Van. The report stated lead was to be seen almost at the surface, that it had plenty of water-power, thereby saving a considerable expense in working, and that the speculators would shortly be rewarded with a rich prize. Indeed, at the first meeting it was mentioned that the mine failed there was peat enough on the surface to pay a dividend. Now, what is the present state of the case? The shares are unmarketable, and have been so for a very long time; indeed, I have no recollection of seeing them quoted in the Journal only at the original price. I could mention other progressive mines, such as West Tankerville, South Roman Gravels, and Pennerley, latter returning about 75 tons of lead ore per month, and realising upwards of 12,000^l. per annum. Surely that amount cannot all be required for expenses and labour. It is hoped that someone interested in the management will render an explanation, which may reassure the shareholders, and give some satisfaction to the subscriber.

Nothing more nor less than a course of ore. Something that is merchantable, and will leave a good margin of profit. Granted that at the 80 a rich discovery is made, comparative poverty is simply turned into superlative wealth, but the 80, even extended in length, may be no better than other parts of the mine; and yet, with this lode never fails. Now we come to the point. I do not say that an old stone quarry will yield silver and copper, but I do maintain, from positive and undeniable truths, that a strong healthy copper lode must be composed of mineral matter, such as gossan, flookan, prian, peach, mundic, &c., and as a general rule it will average 1 per cent. of copper. Fancy an inspecting day, and all the head guns ready to have a peep at this new point. What will be the unanimous opinion there can be no question; from eyes as well as mouth issue the word "poor." Why? Because 1 per cent. copper is unsaleable. There may be a lode 10 ft. wide, but still it is of no value, although a leader of 2 feet, 7 or 8 per cent. would be the actual coveted prize. I have just said that the average is 1 per cent. copper as a general rule, by this, meaning that 1 per cent. is not always found. But taking an ordinary successful mine (one that returns 5s. in exchange for the expenditure of 10s., 50 fms. depth, one ton with the other will average nearer 2 than 1 per cent. This statement is verified by the scores of old burrows throughout Devon and Cornwall giving 1 to 2 per cent. with country and lode mixed together. The silver question is different, as it is almost an impossibility to discover a grain or a ton of mineral per ton, and whoever contradicts this is either absolutely ignorant upon the subject or wilfully perverts the truth.

It is now time for me to cast aside the garb of a novice, and claim my right as being one of the best authorities upon the matter—as for the past twelve months it has been my continual study, and, although not exactly a wiseacre or an oracle, I still do not profess to be a fool. I have rushed into print, and made myself public with but one end in view—the advancement of mining generally, and the winning of such a name in the cause that shall be the very touchword of success. Yes; the name of Barnard shall be handed down to posterity as the very emblem of successful English mining, the symbolic sign of perseverance under difficulties; the very name shall represent mining wealth, as I have of a verity discovered far more than the philosopher's stone. These few remarks flow from my pen calmly and dispassionately. I know what I know, and have the secret protected by Royal Letters Patent, by which the whole of our English copper mines can be turned into colossal fortunes. There are millions upon millions of tons of stuff in Devon and Cornwall, averaging at least 1 per cent. copper and 6 ozs. silver per ton: this is worth 2^l. As I can by a simple and very inexpensive process transform it into 70 cent. copper and 400 ozs. silver per ton, ready for the smelters, or further and complete manipulation by the representatives of the mines themselves—we will say nothing about arsenic or sulphur. Again, the largest portion of English lodes contain 5 lbs. to 10 lbs. of tin. Some of our noted men affirm that 10 lbs. will pay. Is not this doubtful? I am called sanguine, but a less sanguine man never lived, as I simply believe in nothing except nature (not human nature, God forbid, after all my sufferings), a Divine law, and facts and figures. The 10 lbs. tin represent the facts, but the figures are missing, since the money value is only 1s. 6d. Your numerous readers are, I know, very fond of pure logic. Here is a little bit of home spun. Kindly pass the bunkin-bottle—surely I deserve just one dip. Ah! now I breathe again. Well, figures without facts are bad enough; but facts without figures are bad indeed, since the former only emanate from an imaginative mind, but the latter pourtray a disordered brain. For my part, I recognise neither separately, but the twain in one flesh.—*Abbey Mount Tarstock.* THOS. J. BARNARD.

PAYMENT OF MINERS—THE FIVE-WEEKS SYSTEM.

SIR.—Permit me to inform your reviewer that I am not contending about the work month, it is the payment at the end of every fourth week, without at the end of five weeks four times in the year—hence his remarks in reference thereto will not apply. It is satisfactory to me to find him admitting that more frequent payments would be to the advantage of both employer and employed. Without returning the compliment as to what, if any, school your reviewer got "his experience in," it is evident he does not understand what charges come under the head establishment, hence I must inform him that it includes all those charges necessary to keep the mine clear of water and in working condition, without operating on a single fathom of ground, in which is comprised, of course, charges for pumping machinery, pit work, purser's, agents' salaries, office expenses, rents, rates, and incidentals, and these, I find from the school I have got my experience in, remain about the same, whether they work or play; the inference your reviewer ought to have drawn from my remarks, is that the construction I think they would very fairly bear, was this, that as the establishment charges cannot be reduced below a given amount it is our duty to see that they bear as small a proportion as possible to the regular expenditure, and this would not be the case unless the mine labour were utilised to its fullest extent every week, week by week throughout the year.

I must freely confess that I fear matters are too far advanced to hope to settle them without some strife betwixt capital and labour, but much more might have been done in this direction than has been, and employers might have gained much by concession; there is not much fear of unjust exactions or impositions from steady, honest, and industrious men, provided the just thing is meted out to them; the lazy, of course, seek every opportunity to make demands the most unjust and unreasonable, but as these are few in proportion to the others, our duty is to see that that portion of the labouring community which is willing to give fair value in labour for the money received is not expected to do more than this. So far as the Cornish miner is concerned, if adventures are willing to pay without reflecting on their agents the amounts honestly earned by the men, and the agents will let a piece in sight, without reference to the past strikes, a scarcity of labour will be unknown in this country. There are several side issues which I may notice if spared to enter upon the new year.—*Pur. Dec. 26.*

[For remainder of Original Correspondence, see to-day's Journal.]

TRUMPET CONSOLS.—The 26 shares in Trumpet Consols Mine were sold to Messrs. J. H. Trevithick and Sons on Saturday, at 5^l. per share. We hear the mine is looking better.

Castle-an-Dinas (near St. Columb).—The machinery and effects of this mine are all to be sold peremptorily. Castle-an-Dinas was in 5000 shares, with 2^l. per

Meetings of Public Companies.

GAULEY-KANAWHA COAL COMPANY.

A special general meeting of shareholders was held at the company's offices, Queen Victoria-street, on Tuesday, Prof. D. T. ANSTED, M.A., F.R.S., in the chair.

Mr. A. STEUART (the secretary) read the notice convening the meeting, and the minutes of the statutory meeting were taken as read. The CHAIRMAN remarked that the first duty which devolved upon him was to inform the shareholders of the state of their affairs, and he had thought that the readiest means of doing this was to give them an address, which he would afterwards ask them to adopt as his report, upon his visit to the company's property in Virginia. He had put up round the room several maps of the estates, and they would thus be able to follow the report. He then said—

Gentlemen.—It has been decided by the board of directors that you should be invited to meet me as soon as possible after my return from America, where my time has been chiefly occupied in the arrangements necessary for the rapid and complete development of our property. It gives me great pleasure to do so, and explain to you the state and prospects of the coal and timber lands now in our possession, and the nature of the works commenced.

In the report read at the general meeting I informed you as to the nature of the property, and the general correctness of the estimate of its value by the directors before they took the responsibility of forming the company. The original purchase included only the Gauley Mountain Estate, of which the surface is completely covered by a magnificent natural growth of valuable forest trees. In this property the lumber has been first made available this season by the completion of the Chesapeake and Ohio Railway. Every acre of this estate is underlaid by the whole group of seams of the middle coal series, as developed in Western Virginia, and I found on examination, that the quality of coal, and thickness of the seams, are in all respects first-rate. The coals appear to me to be better on the Gauley than they are on the Kanawha.

The Gauley property is approachable for coal working, as I anticipated, by a gorge opening from Gauley River between two and three miles from the mouth of the stream. It is quite practicable to construct a tramroad from the river to the coal, and I should have experienced no difficulty in opening the property in this manner at a moderate outlay. It would also have been possible to improve the Gauley by cutting through shoals and rocky impediments between this tramroad and the river's mouth.

I considered when the arrangements were made with General Imboden, and I still consider, that the terms of purchase of this property were very favourable. The property is valuable, and daily increasing in value as a coal estate, and the timber is in a position to make immediate and large returns. Under these circumstances, the offer to accept deferred shares in lieu of money payments fully justified the terms asked and agreed to. Very few owners of property in the district would have made a similar bargain.

As, however, Gauley River is the natural outlet for very extensive and valuable coal fields at a short distance beyond our tract, and these fields will no doubt be opened before long both by a canal and a branch line of rail passing the gorge, which is our natural outlet, it would be very undesirable to continue our tram and construct a bridge over New River, or improve the navigation, when those works will probably be executed by others for our benefit in a few years.

Finding, therefore, an opportunity of purchasing another coal property nearly adjacent on the same side of New River, but accessible from a point some miles further east, where the river is crossed by the rail, and on terms so favourable that a similar chance is not likely to recur in the district, I at once concluded this purchase, and in doing so I fully recognised that I could not leave the spot until I had absolutely secured the carrying out of the plan which seemed to me necessary to ensure an early and satisfactory result in reference to this new undertaking.

I also undertook to start a lumber business on the Gauley Mountain property, and I have appointed a superintendent of lumber works on that estate. We are now occupied in cutting timber there and rafting it to a steam saw-mill on the railway near at hand, where the lumber will be cut, stacked, and in due time loaded on the railway cars, under contract at a fixed charge of £7 (28s.) per 1000 ft. superficial of 1 in. thick, without any other expense on our part. The mill owners engage to cut for us not less than 3000 ft. of lumber per day.

All the arrangements made in this matter are on a very economical scale, but they involve the investment of a certain amount of capital in wagons, teams, boats, houses, stores, roads, and, above all, wages. The Gauley opens a large timber district, of which no property is better placed than ours for working. None contains better timber, or is so near a market, and I look forward with great confidence to this investment.

The new coal property purchased, which I propose to call the Hawk's Nest Estate, has cost only £2 per acre. The owner did not see his way to reach a market, and had no available capital, even if he had seen it ever so clearly. He wanted to realise, and as he was offered a share in our company to the extent of half the purchase-money he very wisely felt that if we opened the property for him he would not make a bad bargain. Similar properties are now valued and sold at £50 (or 10%) per acre. By securing this estate I saw that with proper energy coal might be worked and carried to market at once and at small cost; and having completed the purchase I proceeded without delay to make it available. For this purpose I ran an experimental line as soon as possible to discover how I could best obtain access to the coal. This was by no means an easy matter, as the lowest workable seam, of great value, is nearly 1000 ft. above the rail, and the country is very wild and in many parts almost inaccessible. We now see our way to overcome all difficulties, natural and accidental, and we have a line pegged out which at a cost of less than £1000 per mile will give us better and cheaper access to the main line of the Chesapeake and Ohio Railroad than has yet been obtained by any property on the Kanawha. This line, of which the gradient is 1 in 18 throughout, will connect at one end with a siding of the main line, and the other will enter the coal on the level in the most convenient manner possible. The coal entered is a noble seam, containing fully 7 ft. of solid coal, of which about 350 acres, containing not less than four millions of tons, are thus rendered immediately and perfectly accessible without further cost. You will understand that the whole expense of opening this part of the seam will be the construction of 3½ miles of railroad. The drainage and ventilation will be perfect, and will involve no deadwork and no subsequent expense. Almost from the day of entering the mountain side the value of the coal extracted will repay the cost of getting, and the work of extraction will constantly advance at an increasingly rapid rate and be subject to no drawback whatever. All timber required can at all times be obtained from the immediate vicinity of the entrance to the mine. This work has commenced and is in actual progress, and I expect shortly to receive the first report from our colliery manager. I propose also to carry a stone drift, or tunnel, through the rock in continuation of the railway, and nearly at right angles to the strike of the coal, to meet a vertical shaft to be sunk from the highest workable seam at its outcrop on the upper part of the mountain; this, in a few words, is my plan of working. On the completion of these works the coal under about 700 acres of land will be at once available for working on the rise by natural drainage. This dead work will probably cost about £2000, and it will occupy about three years to carry through. It will be paid for as it proceeds. It need not be commenced until the mine is in full work and yielding a dividend; but as when completed all the valuable upper seams of Cannel and splint coal will be proved and rendered available, I have authorised the commencement of the tunnel at once.

I should observe that the plan I have adopted differs altogether from that hitherto followed in the American mines above water level; but all practical men to whom it has been shown recognise it as adapted to the natural conditions. I have been able to obtain an experienced colliery manager, at a very moderate salary, who is intelligent, of English origin, and very high character, and who has

managed troublesome mines in the Richmond coal field. He is quite prepared to act under my instructions and carry out my plans. I have prepared a general plan of the Hawk's Nest Estate, and working plans of the colliery on a larger scale; these will be preserved in the office and be kept up to show the progress of the works.

In anticipation of the colliery wants I have ordered 50 coal cars to be constructed. The ironwork is already delivered at Hawk's Nest, and a model car prepared. The cars will be manufactured of our own lumber on the works. They will not cost more than between 6/- and 7/- each, but will be strong and durable, and carry 2 tons. The width of our railway track is 30 in. The rails will be fixed on longitudinal sleepers of white oak, and I only propose to lay a 12-lb. iron, as I consider that, having excellent timber at the smallest possible cost, it is far cheaper, and certainly better, to make our railway on this plan than to lay a heavy rail on ordinary transverse sleepers. It will run smoother, last longer, and cost much less.

The cars as loaded in the mine will carry down the coal by gravitation to the main-line siding, and there be delivered on the trucks screened. The empties will have to be brought back by mules or an engine. A kind of locomotive for this purpose is manufactured at Philadelphia to run into the mine, having no chimney-stack, and such an engine will cost about £2000. It would be desirable that we should provide one of these engines as soon as the works are thoroughly opened and in a position to require its use.

I propose to work the mines with the coal-cutting machine as soon as they are sufficiently advanced to justify the introduction of this new system. No mines can be better fitted for its profitable employment. One of my first purchases was a saw-mill worked by water-power, capable of cutting about 800 to 1000 ft. of lumber per day. This mill, with five acres of land, cost £100, and has been at work ever since cutting lumber for the houses, shops, and other buildings required.

All the timber and lumber for every purpose is obtained from the estate, but to move the trees we required wagons, oxen, and horses. The wagons and teams I purchased, and horses are hired on favourable terms.

A number of houses for miners, skilled labourers, colliery manager, and superintendent, shops for fitting, repairing, &c., a smithy, and various other buildings were required immediately. These have been planned, and several are in progress to satisfy the immediate need.

The Hawk's Nest is exclusively a coal and timber property, the greater part of the land being mountainous, inaccessible, rough, without water, and not adapted for building purposes. It is nowhere less than half-a-mile from the nearest road, and has no access to it. It was necessary to secure access through an intervening farm, and occupy a part of the cleared land of the farm for buildings. To render this possible at a moderate cost I purchased the farm on my own account, and I propose to sell to the company such small parts as they need. The plans for utilising this new property are submitted, and may be examined at the office.

At the time of my leaving America on the 13th inst. I had secured titles to the properties purchased; I had fixed the railway line, set the contract for the grading of the line, and given the work into the contractor's hands, to be completed by May 1; I had appointed a colliery manager, and started the opening of the colliery; I had planned and commenced building a store, offices, shops, and houses, some of which are now occupied; alterations of roads and new roads were in hand; timber for all purposes was being cut, and the stock daily increasing; the lumber business on the Gauley property was in full operation; and I had more than 60 hands employed independently of the contractor's staff. All the requisite plant, tools, and implements had been provided.

I estimate that the total cost of the works in progress if at once properly carried out and fully completed, including purchase of land, wages, and superintendence to May 31, and other expenses, will be about £18,500. Within that time I anticipate, however, that we shall have received a considerable sum for timber sold (of which a large part will be net profit), and I hope we shall then be in a position to put into the market at least 50 tons of coal per day. The whole sum may not be required, but I should prefer to have it available. Like other trades realising large profits, the lumber trade is variable—if there is little demand one year it is made up for by high prices the next. I should, therefore, prefer to be independent, and be able to store the lumber if it cannot be sold to advantage at once. It would be improved by storage, and be sold at a better price after a few years.

In asking you, however, to add to your investments, and divide among you the shares still unallotted, I wish it clearly to be understood that I have not involved you in any necessity of investing this money at present, or spending more than we are at present entitled to call. The original estimate for working expenses on the Gauley Mountain estate alone, and securing means of access to a market, was, as you are aware, £20,000, and for this sum one or other of the plans indicated in the prospectus could have been carried out. What I now ask is that this sum, which is, I believe, more than enough to complete thoroughly everything at present required, should be available for carrying out our present plan—viz., the purchase as well as the opening out of a property that will in a few years enable you to put into the market 1000 tons of coal per day, and also the establishment of a lumber business, of which the profit will alone give you a fair dividend on the whole capital invested, leaving the coal of the Gauley Mountain estate for the present, because it can be more economically opened hereafter. If you will not grant me this sum I can still carry on the works and open the mines, though on a smaller scale and after a longer interval. You must not expect in that case an early dividend, for our growth must be cramped, and the profits reinvested for a time to continue the works. A year or two may then elapse before we can develop as we ought.

You will understand that in this total of £18,500, I include the whole cost of buildings, the metallurgy as well as the construction of the railroad, and the supply of rolling-stock; a considerable outlay for stores, which will be sold at a profit of nearly 50 per cent, and realise much more than 50 per cent. per annum on the capital invested; a large sum for wages expended in paying work; and all costs of superintendence during about nine months. When this sum is expended you will have a property which would be absolutely worth at least £100,000, but I am sure you would not then think of selling it at any price.

I submit a rough estimate of the mode in which the funds of the company will be expended if raised before the works are in profitable operation:

Preliminary and miscellaneous expenses in England ... £	1,200
Purchase of lands of Col. Tyree £3000	
Purchase of building land—rights of way and damages 500	
Purchase and repair of saw mill and land adjoining 120 = 3,620	
Construction of railroad, including all charges 6,500	
Construction of buildings (exclusive of value of lumber) £1200	
Construction of about 2 miles road, and improvement of roads 200	
Construction of 50 coal cars complete 400	
Sundry stores and plant at Hawk's Nest, including wagons, oxen, tools, and implements 600	
Stock-in-trade for sale at stores at Hawk's Nest and Gauley 600	
Sundry stores, boats, wagons, plant, and sundries for lumber business on Gauley Mountain estate, including roads and buildings 630	
Wages account for nine months to May 31 next, exclusive of amounts charged to buildings, roads, and other purposes already estimated in full 3000	
General superintendence, including all salaries in America 500 = 7,130	
Balance 1,550	
Total £20,000	

In the event of the whole of the shares not being subscribed, I could diminish the cost of the railway by 1000£. by postponing the

metalling and sundry works, and I could diminish by a still larger sum the expenditure on wages. The stocks may be kept lower, and the lumber business considerably narrowed, and the return for timber sold must then provide the balance of capital necessary to carry on the works. It is for you, gentlemen, to decide whether this mode of carrying on the company's business is desirable, and whether you will check the growth of so promising an undertaking by keeping back the requisite supplies.

As our principal market will be eastwards, availing ourselves of the Chesapeake and Ohio Railroad, I made it a part of my business while in America to see the Chairman and several influential directors of that line, with a view of obtaining from them an assurance that they would meet us on favourable terms of freight as soon as we are prepared to undertake a large business. The present rate, 14 c. per mile per ton of 2000 lbs., I consider to be unreasonably high, and I succeeded so far as to feel assured that the rate actually charged will be considerably less, and will not interfere with our taking advantage of the large market existing in the eastern cities of America, where coals are now very dear and rising in price. I could have secured contracts in New York with gas companies at very remunerative prices to the extent of 2000 tons per day had I been in a position to supply them. Coal not in any way superior to ours is now used for gas in the eastern cities at a contract price of about 30s. per ton, and is mixed with Cannel, costing at least 70s. Our luminous coal could be delivered, even without special arrangements, for less than 25s. at New York, including all charges, and this would give a handsome dividend on our whole capital if we sold only 100 tons per day.

The Chesapeake and Ohio Railroad is fully open from our terminus to the James River at Richmond, where express arrangements have been completed for shipping coal. From James River there is inland navigation to Baltimore, Washington, Philadelphia, and New York, and the water freights are very low. The railway is also open westward to the Ohio at Huntington, where there are similar shipping arrangements.

Owing to the position of the Hawk's Nest property on the extreme eastern boundary of the part of the great coal field that yields the full series of coals, including splint and Cannel, it is certain that none of the Kanawha collieries can enter into a competition injurious to us for the eastern trade, which includes the iron-making district of Virginia. The nearest Kanawha colliery is 20 miles west of Hawk's Nest. When the canal is completed we shall have water carriage to the West.

I have not neglected the prospects of iron smelting, but for the present I do not advise the expenditure of capital in this matter. Every arrangement, however, will be made to enable us to construct a furnace when the works of the company are more developed, and I have in view an admirable site for this purpose.

Prof. ANSTED concluded by expressing the hope that by the present time they had been able to purchase this site. There were, perhaps, other points which he might have gone into, and he had omitted any particular upon which the meeting desired information he would be glad to furnish it. He then formally moved the reception and adoption of the report.

Rev. Mr. H. M. G. DESMOND enquired what number of shares remained at the disposal of the shareholders?—The CHAIRMAN stated that the number subscribed for and paid upon was 1656; there were also 100 paid-up shares given to the promoters, in accordance with the deed as part payment of the £1000, due to them, and for the purchase of the Tyree lands. 300 fully paid shares were given as part payment, making 2656 allotted in all; of these 1576 had 2/- per share remaining to be called, and 60 had 4/- per share to be called. There were then 1944 shares to allot, which would permit of each shareholder rather more than doubling his present holding. He hoped he had made it quite clear that even if they did not fill up their share list they were quite able to go on with their business, but that the increased capital would enable them to do so much faster. They had a prospect of a dividend at the end of the year from the lumber business, though they could not have earned one by that time from the coal alone. They did not propose to raise coal until their level was 1200 yards in.

Mr. E. J. WILSON supposed that the titles were good, and that they had bought the minerals as well as the lands. He also wished to know whether the railroad to be formed would be upon their own property, and what was the surface extent of their property?—He supposed about 2000 acres?

The CHAIRMAN stated that the titles had been examined, and found to be good. As to the holding of the minerals, they were held absolutely, and merely subject to the ordinary taxes of the country. The company had no royalty to pay. As to the railroad, they had written permission from all the proprietors of land through which they proposed to pass before they did anything on the line. The fact was that in America everyone readily gives land for the construction of a railroad through his property, as it adds so much to its value; at least the necessary documents were signed, and each proprietor received £1 compensation, so as to make it a formal sale. As to the quantity of land, they had about 2120 acres in all. They had no doubt that the title was valid, especially as undisturbed possession for a very short period (five years), together with the payment of taxes, suffices.

Mr. WILSON did not doubt that they had two valuable properties, and was glad to learn that the iron trade was not to be commenced until the necessary funds could be provided out of revenue. He thought that the introduction of the coal-cutting machine would be very important.

The CHAIRMAN stated that all the directors and the secretary were prepared to take their proportion of the unallotted shares.—Mr. WILMURST already held 50 shares, and would take his proportion.

Dr. TROUNCE said that although a director, he was at present a holder of 40 shares only, but after the report he was quite ready to add 120 shares to that number if he could have as many.

The reception and adoption of the report was then unanimously agreed to, and it was resolved, upon the proposition of Mr. DESMOND, seconded by Mr. WILSON, to issue the remaining shares pro rata, and to give such shareholders as desired it the option of taking the surplus.

Mr. SHARP (the company's solicitor) read and explained abstract of conveyance and opinion as to title. Properties described as Nos. 1, 2, and 3 have unenclosed title; No. 4, embracing 78 acres, is incomplete in minors, and only awaits formal decree of American Court of Chancery to vest it in the company; Nos. 5, 6, and 7 are perfect; but it should be seen that the liens on No. 7, stated to have been provided for by Gen. Imboden, had really been removed. He presumed from the formal conveyance before him that they had, but thought it might be well to have a direct assurance on the point.

Upon the proposition of Mr. DESMOND, seconded by the Rev. H. W. SMITH, thanks were voted to the Chairman and directors, and the proceedings terminated.

ST. STEPHEN'S HEMATITE IRON ORE MINING COMPANY.

The meeting of the shareholders was held on Monday, at the London Tavern, Mr. BUCKLEY in the chair.

Mr. SANDEMAN (secretary) read the notice convening the meeting.

The report of the directors was read, as follows:—The directors beg to refer the shareholders to the printed balance sheet of the company for the first year ended on Oct. 17, with the auditor's certificate attached, a copy of which has been sent to each shareholder of the company. They also beg to submit a supplementary statement showing the financial position of the company at the present time, and also call attention to the annexed report on the state of the works by the company's engineer, Mr. J. D. Kendall, of Whitehaven, dated Oct. 23, 1873. The directors have pleasure in referring to the fact that the financial difficulties which, up to a late period, interfered with the proper development of the mine have been satisfactorily overcome. In conformity with the resolution passed at the extraordinary general meeting, held on Nov. 29 last, the directors obtained a loan of £4500, from some of the members of the company, for a period of three years, from Dec. 15, 1873; the interest payable thereon being at the rate of 10 per cent. per annum, and no commission has been incurred in the transaction. A mortgage of the company's properties has been granted in favour of the lenders, and also a charge on the amount not called up on the 9200 A shares allotted up to this time—7s. 6d. per share. The lenders have the right of taking re-payment of the principal to the extent of £1500, in fully paid-up A shares of the company at par. The company has the right of paying off the loan at any time upon giving three months' notice to the mortgagees. The directors do not expect to have to make

funds, and there was nothing else to charge it against except capital.—The SECRETARY said the cost of getting out the ore was debited to revenue.—The CHAIRMAN said that as soon as there was a revenue all proper items of expenditure would be charged against it.—Mr. BRADFORD said he hoped that in the next balance sheet these charges would not be brought against the capital of the company.

The CHAIRMAN said that some of these charges might really be looked upon in the light of preliminary expenses, which in most cases were charged over a number of years.—Mr. SHERMAN: Until the thing is established, and in working order, you cannot charge certain things to revenue. All the money which has been expended has gone to the improvement of the mine.—A SHAREHOLDER: And the expenditure has made the mine worth 30,000*l.*, now in the opinion of a competent engineer, whereas formerly it was not worth one-fourth of that amount.

The SECRETARY remarked that there was an immense quantity of timber, upon which it was believed a very large profit would be made.—Mr. SHERMAN: There is a good deal of timber sold from different mines in England.—A SHAREHOLDER said that the timber which was sold was in a different state to what was found in this mine; it was washed, and the grit got rid of.—Mr. SHERMAN said if the directors could make sure of a profit they would soon put up works, and wash the timber; but until they were fully convinced on that point they would not expand money upon it.—The CHAIRMAN said that every effort had been made to sell the timber, and no doubt a very handsome profit would be obtained from that article when they got fully into work.

After some further unimportant discussion, Mr. SHERMAN moved that the directors' report and balance-sheet be received and adopted.—Mr. SHELDRAK seconded the resolution, which was put to the meeting and carried.

Four of the directors were then re-elected, and two gentlemen representing the Whitelhaven members were also elected directors. Mr. Hadland was appointed auditor.

The CHAIRMAN said the company had now commenced the sale of ore, and he believed their position now was a remarkably good one. He looked forward with the utmost confidence to the future.—The meeting then broke up.

CEDAR CREEK GOLD MINES AND WATER COMPANY.

A general meeting of shareholders was held at the offices of the company, Austinfriars, on Monday, to enable the company to borrow a sum of money, not to exceed 25,000*l.*, upon debentures.

Mr. GEORGE LATTERS in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting.

The CHAIRMAN said that since the directors last met the shareholders considerable progress had been made at the company's works. Seven claims had been rigged up ready for working, and according to the last advices much better results were promised than were realised during the past year. The reasons inducing the manager, Col. Ludlum, to anticipate better results were these—there were better "faces" in most of the claims, the works were more perfect, and a much better water season was expected. The main work to render the property permanently remunerative in its character was the driving of the Yankee tunnel, which had already been completed for 250 ft. of the 600 ft., to come under the Yankee Mine, which was considered one of their best claims. The remaining 350 ft., it was expected, would be driven by about March, as by means of the Burleigh drill, which had no doubt arrived at the property by this time. Col. Ludlum calculated upon driving at the rate of 100 ft. per month. As soon as the work was accomplished, and the rich "blue lead" reached, progressively satisfactory results would be realised. The prospects of the water season would appear to be assured, inasmuch as there had been a very heavy snowfall; and had it been followed by warm rains the directors would have had good results to report before now. There were three gentlemen in the room who could tell the shareholders a great deal more about the property than he could, and especially Mr. Gutierrez, who held between 2000 and 3000 shares, and had just returned from a personal inspection of the property. The object of the present meeting was to consult the shareholders upon the desirability of purchasing a number of claims—13 in all—that the company's tunnel would pass under. Before starting this tunnel, Col. Ludlum, seeing the desirability of possessing these claims, obtained the option of purchase at a comparatively low price. Col. Ludlum had the foresight to obtain this option before the fact became known that it was intended to drive the tunnel in that particular place determined upon. The total sum to be paid was 12,250*l.*; the tunnel ran under these different claims before it reached the company's present property, and the "blue lead" was believed to be under the whole of them. The directors were of the unanimous opinion that the purchase was most desirable, and it was most strongly urged by the manager. There was a mortgage in California upon the property, for which they paid 1 per cent. per month, which was considered the Bank rate out there. It was, therefore, proposed to issue debentures to the extent of 25,000*l.* as against the unissued capital, so as to purchase these claims and work them, and also to pay off the mortgage. Had they had the capital they would last year have expended 2000*l.* or 3000*l.* in improving the ditches and making reservoirs, thereby lengthening the water season to at least some eight or nine months of the year. Last year's workings were upon the first section of the gravels, so that they had not yet had the benefit of the "blue lead" at all, but that would be available for working towards the latter part of the present water season by means of the deep tunnel. There could be no doubt if these additional claims were purchased, largely increased profits would be realised for a long period of years. The directors were quite prepared to back up the scheme by taking a considerable proportion of the debentures, which would be only created as against the unissued share capital. It was proposed to issue them in small denominations of 20*l.* and 100*l.*, and to carry an interest of 10 per cent. per annum, payable quarterly, repayable in two years at the option of the directors, and the whole redeemable in five years, with a bonus of 5 per cent. Supposing the whole were issued, the charge upon the company would be 2500*l.* per annum. The profits divided last year were 8600*l.* in the imperfect way they were then working, so that the security for the debentures was a thoroughly good one. They were dealing with a very extensive property—one of the most extensive in California, and on that possessed resources that could not be worked out in the next 50 years. There was an important option attaching to the debentures—that they may be exchanged for shares at par. That might seem a remote contingency, seeing that shares were now at a discount; but long before the expiration of the five years there was every reason to conclude the shares would stand at a very high premium. He then proposed the following resolution:

"That a sum of money, not exceeding 25,000*l.*, be borrowed by the company upon the security of debentures, payable to bearer; each of such debentures to be of not less value than 20*l.*, and to be payable at the end of five years from this date, and to bear interest at the rate of 10 per cent. per annum, payable quarterly, redeemable after two years from this date, at the option of the board, at a premium of 5 per cent., the holders of each debenture to have the option or privilege of exchanging them for the ordinary shares at par at any time during its continuance."

Mr. GUTIERREZ said—Holding a large interest in this company (upwards of 2000 shares), and being in California last December, I took the opportunity of re-visiting the Cedar Creek Mines (having previously done so in 1871), and was highly gratified with the progress made in the numerous and valuable claims belonging to us. We possess, I believe, about 400 or 500 acres of auriferous ground, from 200 to 300 ft. deep, the "blue lead," or richer portion, varying from 100 to 150 ft. in depth; also an enormous supply of water, 6000 miners' inches in the season, equal to 50,000,000 gallons for every 24 hours. The gravel is very rich in this locality; one claim adjoining returned \$1,500,000. I think our superintendent (Col. Ludlum) is an able and efficient man, and has done everything possible under disadvantageous circumstances for the benefit of the company. The water season had just commenced when I was there—Dec. 3—they having had some heavy rain and snow falls. One claim, the Pacific, had just started, and with a little general weather he anticipated having seven of the claims at work, and 11 heads of water. With fair season he anticipated to do better by 50 per cent. than last year, including the expense of the Yankee tunnel. With regard to the proposition before the meeting, to raise 25,000*l.* to purchase certain claims, redeem the mortgage debt, and improve and increase our water supply, although not an absolute necessity, as we are not in want of funds, I should strongly recommend the directors' scheme, as there is a great distance between the Yankee claim, the first our tunnel reaches, and the Deep shaft, which amounts to 2000 ft., and you will see by a reference to the map that most of these claims proposed to be purchased are on the line of our tunnel, and intervene between the two said claims, and will be approached very shortly, instead of having to wait for the tunnel to come up to the Deep shaft claim. Another portion of this money may be judiciously laid out in damming some of the upper lakes, making reservoirs, and otherwise improving and increasing the water, so as to give us a longer season to this end: it will possibly return us 50 per cent. on such outlay. I have no doubt the directors will be able to redeem a large portion of these debentures in a few years, and you cannot have a better security, as there is not a finer property of this description in California; and if economically conducted will prove an immense success. I think our present dividends will be largely increased as our tunnel approaches completion, and washings from the "blue lead" and bed rock in operation. I have much pleasure in seconding the proposition.

The CHAIRMAN said there was another gentleman present who, during a pleasure trip in America, visited the company's property; and any additional information he (Mr. Hill) could give would be satisfactory to the shareholders.

Mr. HILL endorsed all that had fallen from Mr. Gutierrez. Some of his friends who were shareholders in the company asked him to visit the property during his stay in California last year. Col. Ludlum showed him over the property, and the tunnel at that time had just been commenced; its importance could not be over-

estimated. The "blue lead" was known to be there, from which very extensive profits must be realised—that was tested by means of the deep shaft when he (Mr. Hill) was there; and Col. Ludlum was fully convinced of the existence of the "blue lead" in the Yankee claim, situated at the outlet into Bear river. Whether these additional claims were purchased or not, the tunnel would be a source of profit, as those claims would have to pay for washing through it. The property was a very extensive one, and in September Col. Ludlum had some claims ready, so that they could be commenced at a moment's notice. Whether those additional claims were acquired or not, the company possessed an enormous property, which must last for many years. The existence of the "blue lead" was a matter of certainty. Although not a shareholder when at the mine, he became one when he returned home.

The CHAIRMAN asked Mr. Hill if he were satisfied with the manager in charge. Mr. HILL said that Col. Ludlum seemed to have the interest of the company at heart, and told him while going over the property that he intended purchasing some shares, so satisfied was he as to its value.—The CHAIRMAN said that Col. Ludlum had bought shares.

Mr. STONE (at one time manager of Birds-eye Creek) said he had not been over the property within the past year, but saw the manager just before he came to this country. Col. Ludlum told him he expected to do very much better this season than last. In Col. Ludlum they had a very efficient manager, and one heartily devoted to the interests of the company.

Dr. CHARLTON asked Mr. Stone for an explanation of the statement in his report attached to the prospectus that a profit of \$300,000 per year would be made for a long series of years, and saw no reason why it should not be \$500,000.

Mr. STONE said the original holders left the property in so bad a condition that it was almost impossible to realise any satisfactory result—that was the main reason they had not realised the profits he anticipated.

The CHAIRMAN said they had themselves to blame to a certain extent, as the whole of the capital was not got out; there was no doubt, however, when the property was taken over it was in a very bad condition, but by perseverance the difficulties were gradually vanishing, and there was no doubt that in the end all shareholders would be well satisfied.

Dr. CHARLTON said that, as an original shareholder, he should prefer the company remaining as it was, paying dividends of 7½ per cent.

The CHAIRMAN said but few of the shareholders would be satisfied with 7½ per cent., the more especially as the dividends could be very largely increased by the acquisitions proposed. They really had not yet received the fruition of their workings—the results indicated by Mr. Stone. Shareholders should bear in mind the important fact that the financial operation now proposed would not increase the company's capital, because the unissued share capital represented the amount proposed to be raised upon debentures. He should be glad to take his proportion.

Mr. LAVINGTON, in reply to a question, stated that the interest on the debentures would commence from the date of payment.

Mr. ST. ALPHONSE (a director) said that his friends and himself held a very considerable interest, and were quite prepared to subscribe for their proportion of the debentures. The resolution was put and carried, with but one dissenting voice.

A vote of thanks to the Chairman and directors closed the proceedings.

GREEN HURTH LEAD MINING COMPANY.

The ordinary general meeting of shareholders was held at Newcastle-on-Tyne, on Dec. 30.—Mr. J. C. SWAN in the chair.

Mr. J. H. ROBINSON (the secretary) read the notice convening the meeting and statement of accounts for the 12 months ending Dec. 15, showing a debit balance (5272*l.*. 10*s.*) having been paid in dividends during the year of £37,17s. 9d. The assets, including 250 bings of ore undressed and partly dressed—125*l.*.—exceed the liabilities by 1209*l.* 2*s.* 3*d.* The total paid-up capital is £64*l.* 2*s.* 9*d.*

The directors reported that the important work of making the road from the mine to the Alston turnpike-road has at length been completed. This has been a very heavy undertaking for the company, but it has been well done, and it has been entirely paid for out of revenue. The saving in cost of carriage will, however, soon compensate the company for the large outlay incurred on this necessary work. There is no doubt that the company might have done a larger amount of profitable work during the past year if they had been able to offer more and better lodgings accommodation to workmen. The directors consider this most important matter, and they have at present some proposals before them which they have reason to think may enable them to accomplish something satisfactory in regard to it before the next meeting of shareholders.

Capt. W. YIPOND, after reporting upon the various points of operation, stated that they had sent to market to date 950½ bings of ore, and have 10 bings more dressed, also 250 bings in house, crusher work, cherts, and slimes. They have also delivered dues to the Lord of the Manor, 108 bings. They have taken up the rail-way, completed the cart-road to the mine, and have greatly improved it lately. The prospect for the ensuing year is much better than it has ever been before. The new south end is still very productive, yielding upwards of 20 bings of ore weekly, and we are now in a position not only to work the ore left in the lower part of the limestone under the level, but also to go ahead at the same random down in the cross veins—out of the old vein, and Annie's vein, which are all productive, in the upper parts, of lime-stone.

The retiring directors were elected, and the secretary's salary increased from 50*l.* to 100*l.* per annum. The proceedings terminated with the usual complimentary votes.

NANT-Y-GLO AND BLAINA IRONWORKS COMPANY.

A special general meeting of shareholders was held on Wednesday at the City Terminus Hotel for the following purposes:—"To accept the resignation of the present directors of the company, to reduce the number of directors, and to appoint five new directors.

The Hon. W. N. MASSEY, the chairman of the company, occupied the chair at the commencement of the proceedings.

The CHAIRMAN commenced the proceedings by stating that the present meeting was summoned for the purposes stated in the printed notice which had been sent to each shareholder. The first resolution was merely formal, because the resignation of the directors was accepted at the last meeting, and was to take place as from today. It was considered necessary that a formal resolution should be passed to accept the resignation of the present directors of the company; and that being merely a matter of form, he must put it to the vote. It was decided to accept the resignation of the present directors of the company; and that being merely a matter of form, he must put it to the vote. Now, having ceased to be chairman of the company, he had to vacate the chair and express his earnest wish that the successors of the present board would not have to encounter the difficulties which the old directors had passed through; and he hoped that by able management this splendid company might be placed in a position to earn a good return.

The old directors then left the room.

Mr. OGDEY moved that Mr. Hugh Mason take the chair.—Mr. RUSSELL EVANS seconded the motion.

The resolution was put and carried unanimously.

Mr. HUGH MASON then took the chair amidst loud applause. The CHAIRMAN said that they were now assembled in special meeting; and although the business to be transacted was more of a formal and special than a general character, still he should take the opportunity of making a very few observations with regard to the present position of the company and its future prospects. He had to thank the shareholders of the Nant-y-Glo and Blaina Company for the great cordiality and unanimity with which they had supported himself and his friends in Manchester in the recommendations which they had felt it their duty to make with regard to this concern. It might be asked why had he, not a very large shareholder in this company, and having a large business of his own which needed his personal superintendence and control, and having also a considerable amount of work of one kind or another to discharge, seek to add to his labours by connecting himself with this undertaking? And a similar question might be put to the other gentlemen with whom he was about to be associated on the board. He must say, and he said it frankly and unreservedly, that if he had foreseen the amount of work which would have been cast upon himself as a consequence of his interference in the affairs of this company he certainly would have shrank from interfering in the slightest degree. No compensation of a pecuniary character which was possible, to agree to him as one of the partners of this concern—however prosperous might be the future of the company—could recompense him for the sacrifices he should have to make, and which he had hitherto made—(hear, hear)—but he had yielded to the pressure of a large majority of the shareholders of this concern, who had shown unbounded confidence in the single mindedness and integrity of his purpose in connection with what he had done. (Cheers.) And he had agreed to do what laid in his power—in association with other gentlemen, whom he highly esteemed and valued, not only as to their personal value, but as men of great business experience—to do what he could with them to resuscitate the fallen fortunes of this company. He (the Chairman) had the deepest sympathy in his fellow-sufferers in this concern; especially had he deep sympathy with the large proportion of ladies, and with the considerable proportion of clergymen and gentlemen of comparatively limited incomes, who had made investments in this undertaking in good faith that what had hitherto been said about it was true and honest, and that its management would be such as to reflect credit upon those who were at the helm of affairs; and it was on behalf not only of his own private interest in any shape, but on behalf of his fellow-sufferers in this concern that he ventured to take upon himself an additional amount of work to that which he had daily to perform. (Cheers.) He stated at the last meeting that there were upwards of 1300 shareholders, and that the average holding was only five shares and a fraction, and the latter fact would show how the shares were scattered in very small quantities over the body of shareholders. He had entrusted to him the proxy of nearly 1000 of those shareholders; and if anything could inspire him to do what laid in his power to promote the interests of the company in future it was the confidence which had been placed in himself and the gentlemen with whom he had been very lately associated in regard to the work which they might be called upon to undertake for the company. He was quite sure it would not be necessary to use those proxies at the present meeting, for he was satisfied that the same unanimity which had charmed him to the previous meetings would prevail to-day, and therefore, he only referred to the proxies in order to give the meeting the information that he was supported by the great body of the shareholders. (Cheers.) Now, it was impossible for him to accept the chair at that meeting without making one or two remarks with reference to the old directors. He regretted that the old directors had left the room; he would much rather that they were present as listeners to what he had to say of a personal character towards them, and he would say very little, rather than they should read it in the public journals on the following morning; but it was impossible to refrain from making one or two comments with respect to their past misconduct. (Hear, hear.) The shareholders had paid the Chairman of the company 500*l.* a year, the Deputy-chairman 400*l.* a year, and the directors individually 200*l.* a year, as salary for their work. Now, he would say this, that if those gentlemen had done their work he would be the last man to begrudge the payment of their salaries; but the amounts which he had stated did not cover the whole of the emoluments which those directors had received. The personal expenses of the directors had been very largely beyond the amounts which had been stated, for they had, of course, their travelling expenses and hotel bills paid, and those charges had been made with the most unbounded generosity on the part of the directors towards themselves—(a laugh)—so that the annual expenses of that old board of directors, that discriminate body of men—(hear, hear)—had cost the shareholders

many thousands a year beyond what the shareholders had known. (Hear, hear.) Would the shareholders believe that between the annual meeting on Nov. 15 and the adjourned meeting of Dec. 5 the monthly allowances—for they received their allowances monthly—had been offered to the old board of directors, and accepted by them and received; between the date of the two meetings their allowances became due, and cheques were drawn, and with one honourable exception—that exception being Mr. Reed—every one of those directors had pocketed his monthly allowance. (Shame.) It was shameful, it was mean, it was base in the extreme. One would have imagined that after the losses which they had brought upon this concern during the past twelve months, and after hearing the censures which were made regarding their misconduct on November 15, they would not have been so lost to common decency, and to the common feelings of humanity towards suffering men and women, as to actually receive their monthly and quarterly cheques for their directorial allowances. He stigmatised such conduct with language of the highest degree; the very least that body of men could have done would have been to have said "We have forfeited the confidence of our fellow-shareholders, we acknowledge we have mismanaged this fine property, and that we have sacrificed our fellow-shareholders' money, and we cannot, in common decency, any longer receive this generous payment." He felt bold to say another thing, which was this—that if any of the old directors received their qualification of shares as a gift from Mr. James Carlton, the vendor of the property, if they did so receive and became shareholders in this concern without having contributed one shilling money towards the purchase of their shares, surely if there were any value in the shares at this moment those men were bound to give up what they held, in his opinion, so unjustly, and to that extent, at least, make a little pecuniary sacrifice on behalf of those whose money they had so recklessly squandered. (Cheers.) He put these words interrogatively, but he had no moral doubt of the fact; he made bold to say it, that there were men in connection with the late board who had been guilty in that sort of way.—A SHAREHOLDER: It is a fact.

The CHAIRMAN said he believed it was a fact. He was not in Mr. James Carlton's confidence, and so he had not the information from that gentleman. (A laugh.)

In the early part of the year 1873, when the shares of this company began gradually to fall in the market, he himself had two interviews at very short intervals with Mr. James Carlton on the subject. That was the first time he (the Chairman) had taken any care or thought whatever concerning this investment, which he had made at an earlier period, and Mr. James Carlton told him that he himself had such unbounded confidence in the concern that he was at the very time increasing his holding in the ordinary, or deferred, shares. He thought that if any man was doing that, especially Mr. Carlton, the deputy-chairman, it showed great confidence in the undertaking, and he must say that after leaving Mr. Carlton he felt that the property was a very valuable one, and wondered that the general public who had money to invest were so shortsighted as not to buy the most tempting thing in the market. (A laugh.) He had made it his business within the past few days, by reference to the books, to see to what extent Mr. Carlton had increased his holding as an ordinary shareholder, and he found that during the year 1873 Mr. Carlton did not purchase one single ordinary share. (Oh, oh.) He must call a spade a spade, as he was accustomed to do; he did not say that there was not one word of truth in Mr. Carlton's statement, but he certainly had failed to find the proof of the truth of the statement, and he would leave the shareholders to form their own conclusions, and apply the correct epithet. (Cheers and laughter.)

But at the time Mr. Carlton was increasing his holding in the preferred stock to the extent of 70 shares; but Mr. Carlton quickly disposed of the 70 preferred shares which he had bought, and who did the shareholders think was the purchaser? Why, he sold them to his own book-keeper. (Shame.) The fact was that the more he looked into the conduct of the vice-chairman of this company the more he was astounded—shocked and disgusted. (Cheers.) He carried his investigation further to see if this bookkeeper still held the shares, and he found that

A SHAREHOLDER: Will you endeavour to reduce the expenditure, and remove some of the officers?

The CHAIRMAN said they had only that morning been considering how they might get rid of the present expensive office in London. He saw great room for retrenchment. The expenditure had been of a most extravagant character, but at the first board meeting the directors would get into harness, and the subject of the expenditure would be at once carefully considered. He ought not to leave that room without expressing his obligations to Mr. Richardson, who had given most valuable information in connection with the company. (Hear, hear.)

Mr. McCLEWEN, of Manchester, moved that a cordial vote of thanks be given to the Chairman. He had the fullest confidence in the board, and believed they would see that justice would be done to the shareholders. (Cheers.)

Mr. SCOTT seconded the resolution, which was put to the meeting and carried.

The CHAIRMAN acknowledged the compliment, and the meeting broke up.

A letter, of which the following is a copy, was found in the cheques book of the company:—

"To the Secretary, Nant-y-Glo and Blaina Ironworks Company (Limited). Sir,—Having mislaid or lost the cheque you sent me on Nov. 29 last for 50/-, being my directors' fees for three months, and in consideration of your handing me another clue to replace that, I undertake to guarantee you against any loss in the matter, it being understood that you have stopped payment at your bankers. —HENRY G. LENNOX, London, Jan. 7."

The noble lord does not appear to have attended a single meeting of the board during the quarter for which he claimed and received the sum of 50/-. It further appears that cheques for the salaries of the old board from Nov. 29 to the 7th inst., amounting to £50/-, were signed, although no meeting of the board had been held. Mr. H. Bailey and Lord Lennox have cashed their cheques, the others have been impounded by the new board.

LLANRWST LEAD MINING COMPANY.

The statutory meeting of shareholders took place on Friday, Jan. 2, at the offices of the Company, Gracechurch-street,

Capt. A. STRONGE GILBERT in the chair.

The report was published in last week's Journal.

The CHAIRMAN said they were called together on the present occasion by the Act, which provided for a meeting to be held four months after a company was incorporated, and therefore they had not had much time to develop their property to the extent they hoped to do very shortly. The company, too, had been started at a time of the year when things were rather dull, but at the same time they had all read the prospectus, and the reports, and the gentlemen on the board with him had made themselves fully acquainted with the property. The shareholders would at once see that the property was an unusually valuable character, and the lead was always to be found in satisfactory quantities. Capt. Knapp, whose name was well known in connection with mining matters, had taken charge of the mine, and he (the Chairman) could not do better than allow Capt. R. Knapp to expatiate to a certain extent on its merits, and he would also ask that gentleman to read his last report.

A SHAREHOLDER, who asked permission to address the meeting before Capt. Knapp spoke, said from the short time at his disposal he should be compelled to postpone any lengthened remarks. From the appearance of the ore which he had seen in the outer office, they had a very strong and splendid lode. Everything so far as a man could judge, was to be seen mixed up with the lode to produce a very good property in depth. He had not seen the mine, but anyone who understood lead mining need not go further than 85, Gracechurch-street, to see the ore. He believed they could all rely on the ore having come from the mine; indeed, there was no doubt that the ore had come from the Llanrwst Mine. Capt. Knapp could vouch for that. It seemed to be a property that could be worked very cheaply, and all that was required was a stone-breaker, a crusher, and plenty of water, to wash the ore and return it to market—(hear, hear); and when he said that, he thought there was nothing further to do than to prosecute the work vigorously, which would result in returning a large pile of ore that the captain informed him was now at the surface ready to be dressed, and he would recommend the shareholders to supply the means to lay down dressing-floors at once, for he considered they were quite justified in the outlay. He had known Capt. Knapp for the last 16 or 18 years, and he had always found him to be a thorough lead miner. He possessed what was very much wanted in most mines—very great energy.

Capt. KNAPP said, as he was not much accustomed to addressing public meetings, he had embodied his views in a report, which he would prefer to read; and then, if necessary, he would be glad to answer any questions, or give any information shareholders might desire. Capt. Knapp then read the report.

The CHAIRMAN said he believed there was no man connected with the mining interest who would be able to give more information, or better able to answer any questions on the subject of mining, than Capt. Knapp.

Capt. KNAPP was very much obliged for the kind manner in which his name had been mentioned, and would say a few words as to his becoming connected with this property at first. He was in London on business connected with a mine in the United States in which he was largely interested. He met Mr. Endean, who, knowing something about his former connection with mining in Cornwall, asked him to accompany him into Wales to look at a property he was connected with there; and although the mine was barely accessible, and they had to get down with a great deal of difficulty, he nevertheless felt he was standing upon an immense amount of wealth. It was difficult for gentlemen who had stood upon an amount of mining to realise how it was that a person felt he was surrounded by wealth. There was a sort of genius which belonged to mining which could not be described, yet one felt it was surrounded by those stones which, under development, must conduce to wealth. He expressed himself so to Mr. Endean, and said they were standing on no ordinary ground, and he would risk his reputation on it. He hoped by the time they next met there would be more tangible results. The operations had been carried on a limited scale, but in order to progress the scale of operations must be enlarged, and he had no doubt they would make this enlargement, and supply the necessary means for further developing the mine. It would not be a large amount that would be required, because they already possessed the mine, and wherever they worked they opened up more ground. He did not know that he could add more to the report, in which he had embodied his views, and he was as sincere in what he had stated as if his fortune and life depended upon the truth and accuracy of the statements he had made. (Cheers.)

The CHAIRMAN was sure they would all join with him in returning their best thanks to Capt. Knapp for the very energetic way in which he had devoted his time to this property, and he believed they would all further agree with him that they were particularly fortunate in having such a gentleman connected with the mine in which they were interested. The vendor did not look for actual money but shares, showing his faith in the property.

A SHAREHOLDER said having passed 50 years as a miner, as a mining manager, and as a mining adventurer—in fact, having spent his life hitherto in part mixed up with mining in one way or another, he would like to say a few words on the subject. Capt. Knapp had truly said it was difficult to explain the phenomena connected with mining. He had read every report connected with the Llanrwst Mine with the greatest interest, knowing that they were written by a man who understood what he was writing about. And he had not the slightest doubt but that they had a manager who would do his best for the company; his abilities he knew would not fail him. (Cheers.)

Mr. ENDEAN said, in regard to this mine, that he went into the district for the purpose of viewing a mineral property, and there he visited the Llanrwst Mine, and examined it on the surface and underground, and was struck with the appearance of the rock and general composition of the lodes, which satisfied him there was great wealth in that property, and he resolved, at whatever cost, to obtain it. He made enquiries, and found there were four miners there and three proprietors. They were returning 8 or 10 tons per month with that small force. He took the address of the proprietors, and at once put himself in negotiation with them in order to secure the property. It ran over a period of 18 months before he could conclude the arrangements. Ultimately it came into his possession, and he felt, in reference to the Llanrwst Lead Mine, that they had one of the most profitable and best paying lead mines in the Principality. (Cheers.)

After some further remarks of a congratulatory character, Mr. ENDEAN moved, and Mr. GREGORY seconded, that the sum of 400/- per annum be given to the directors for their services. The motion was carried unanimously.

The CHAIRMAN having thanked the shareholders, Mr. GREGORY proposed a vote of thanks to the Chairman and directors, which, on being seconded, was carried unanimously.—The CHAIRMAN briefly replied.

A hearty vote of thanks to Capt. Knapp, which was at once carried, and after a brief reply by that gentleman in appropriate terms, the proceedings of the meeting terminated.

NEW DOLCOATH TIN AND COPPER MINING COMPANY.

An extraordinary general meeting of shareholders will be held on Tuesday next, when it will be proposed to authorise the directors to borrow for the purposes of the company any sums not exceeding in the whole £6000/-, and to issue by way of security for the re-payment of the principal sums borrowed (with interest thereon at such rate as shall be agreed on) debentures having three years to run, charging the same on all or any part of the property of the company.

The directors, in the report to be submitted, will state that, it being found necessary to raise further capital, counsel advised that there was no chance of issuing the ordinary shares, and preference shares were not permissible, but that the shareholders can sanction debentures. It will be remembered that at the last meeting the patent hammer stamp had been rejected, owing to its large consumption of fuel. This decision was not satisfactory to the patentees, who threatened the company with an action to recover the value of the stamp. Considerable correspondence between the board and the patentees has taken place on the subject, without any practical result beyond staying the threatened legal proceedings; but pending this correspondence no steps could be judiciously taken to equip the mine with the ordinary stamps, and even if it were otherwise the latter could not have been got, seeing that the company's funds were nearly exhausted. Captain R. Pryor (who formerly managed the mine for many years), was selected to inspect the mine thoroughly; his report is of a most favourable character, and fully justifies the expenditure of further capital. A large sum has been expended in opening up for working, and as soon as the stamps are erected many sites on stonethone can be set, and at least 24 heads of the old stamps kept constantly at work, which ought to produce tin enough to yield considerable dividends. In the event of the money being raised in the manner proposed it will be devoted, *inter alia*, to the immediate erection of stamps and dressing-floors, with the other necessary appliances; no exact value of the stamps ascertained. Meantime, Messrs. Vivian have undertaken that the returns will cover the costs of the mine, failing which they will pay the difference.

SATURN SILVER MINING COMPANY.—The meeting convened for Wednesday was postponed till Monday.

NORTH TANKERVILLE.—An extraordinary general meeting was held on Tuesday (Dr. F. Sims in the chair), when the resolution passed on Dec. 18 was confirmed, increasing the capital of the company by 6000 shares of £1 each, to be offered *pro rata* to the shareholders, at 5s. per share, 2s. 6d. to be paid on application, and the remaining 2s. 6d. per share when required, the shares to rank in all respects with the original shares, and as fully paid up.

[For remainder of Meetings see to-day's Journal.]

Lectures at the Royal School of Mines.

ON HEAT.

The sixth and concluding lecture of the series was delivered by Prof. GUTHRIE as follows:—It is quite clear that if a surface has a certain radiating power, the larger the surface is the greater will be the amount of radiation, so that if I scratch the surface, or in any way render it rough, I increase the surface, and the radiation is increased. The same substance, when rough, radiates more heat than when smooth; but with surfaces of different nature we find that some have a greater specific power of radiation than others—*e.g.*, the surface of glass may be as smooth as metal, and yet the glass will radiate heat more quickly than a metal. Here is a hollow tube, into which I pour hot water; one side, coated with polished gold, I turn to the pile, and you see the heat radiated is very little; a second surface, coated with lamp black, now turned to the pile, instantly gives a great increase of radiated heat. A similar increase I can make by coating the gold surface with a solution of isinglass. The latter experiment shows that the power of radiation is independent of the extent of surface, but depends upon the nature of the surface. Another experiment will show how strongly the metals reflect heat. A piece of paper, coated on one side with red iodide of mercury (a substance which turns yellow when heated), has on the other side a strip of gold leaf pasted; over this latter surface I will move backwards and forwards at a short distance this red hot iron, and now looking to the other side of the paper, we see the whole is turned yellow, with the exception of that portion directly underneath (and protected by) the strip of metal. The different powers which different substances have for radiating heat is beautifully shown in Nature in the formation of dew. The heat of the sun is absorbed by the earth during the day, and given out during the night when that part of the earth is, as it were, in the earth's own shadow into empty space. The air always contains moisture, and if the air is saturated with moisture during the day, when the earth and the air above it are alike cooled by radiation during the night, the air cannot hold so much watery vapour in suspension, or in gaseous solution, and it deposits it on those portions of the earth which radiate heat most rapidly. In a similar manner a glass of cold water, taken into a warm, moist room, rapidly becomes coated with drops of water on the outside, condensed from the moisture in the air; this vessel, which contains a freezing mixture, has not only thus condensed the moisture of this room, but has actually frozen it, and you see it is now coated with hard frost, so that if I could prevent the earth from radiating heat, and so getting cooler, I should prevent the deposition of dew, and you know there is no dew formed on a cloudy night, one reason being that the clouds reflect part of the heat which strikes them back to the earth, another reason being that through moist air the heat of the earth cannot escape so readily. Yet moist air is quite as transparent to light as dry air. Pure steam or vapour of water is a gas, and is invisible; the steam issuing from this boiler forms clouds of so called steam, really collections of minute particles of water, and if I heat this cloud you see it at once disappears. Thus we see that the quantity of vapour of water which the air can hold in suspension depends upon the temperature of the air. The clouds of "steam" issuing from the chimneys of locomotives are absorbed almost immediately by the air in dry warm weather, but remain visible for a long time in damp weather. To determine the quantity of vapour in the air, we use an instrument constructed on the same principle as the cryophorus, and called a "hygrometer," containing ether instead of water. By condensing the vapour of ether in one bulb, by evaporating ether poured outside, the liquid in the other bulb is cooled till moisture condenses on it from the air, and then by a thermometer; the temperature at which this takes place is observed, and we thus get a "measure" of the quantity of vapour in the atmosphere at that particular place and time.

Bodies may allow light to pass through them freely (transparent), and yet may arrest heat; those which allow heat to pass through we might call "translucent," or more usually "diathermic." Here is a screen, with a hole in the centre; in front of the screen will be placed a source of heat (a red-hot copper ball), and behind the screen, with its hood turned towards the opening, is placed the thermometer. The screen is a double plate, having air (which we know is a bad conductor of heat) between the plates. Before the opening I will place, first, a plate of glass, about 1/4 in. thick, and you see how little heat is transmitted by the glass, now substituting for the glass a plate of rock salt, twice as thick, you perceive at once a very great increase of heat. Another screen of rock salt, coated with lamp black interposed, allows still more heat to pass, although perfectly opaque to light. We may say that for heat of this temperature rock salt is the most diathermic of all solid bodies. A cell of water acts as the glass, while a cell of a liquid, quite as clear and as transparent as water, bisulphide of carbon, stands in the same relation to water as rock salt to glass. This table, which shows the percentage of heat transmitted by different substances—(1) by an Argand lamp; (2) by incandescent platinum wire; (3) by copper heated to 400° C.; and (4) by copper heated to 100° C.—shows clearly by the variety of numbers not only with different substances, but also with the same substance, and different sources of heat, that there are various kinds of heat. If I analyse a beam of light, and then pass the pile through the various colours of the spectrum, you will find that the amount of heat falling upon the pile increases as I pass the pile from the violet towards the red end, and that it attains its maximum at a short distance beyond the red. Thus we see that the heat rays are less refrangible than the rays of light, or than those rays which are visible to our eyes. The refraction of heat may be well illustrated by the ordinary burning glass, parallel rays falling on which are made to meet together after passing through the glass in a point called the focus. The heat is likewise brought to a focus at this point, but I wish to show you that the rays of light and rays of heat are perfectly independent of each other. To do this I focus the light of the electric lamp on this paper screen, and then interpose in the path of the raised beam of light and heat a cell containing a solution of iodine in bisulphide of carbon, which is perfectly opaque to light, but allows the heat to pass through, as you see when I bring the bulb of this air thermometer into the position where the focus was seen to be. Combustibles can thus be ignited, and platinum wire made white-hot in the focus in perfect darkness. When the wire is thus made white-hot we have an example of the conversion of one physical force into another—heat transformed into light—and this particular phenomenon is called calorescence. One pound of hydrogen thoroughly burned to form water gives out in burning 34,462 heat units; 1 lb. of carbon (which is the chief combustible constituent of coal) only gives out 500 heat units.

One of the most familiar sources of heat is friction, but curiously enough it has not been properly studied till within the last 20 years or so. When two substances are rubbed together (as in cleaning a knife, stropping a razor, sawing wood, &c.) heat is produced, and in one of the earliest means of procuring fire was on this principle. Where does this heat come from? Again, I strike a piece of flint sharply with a piece of steel; sparks are struck off, which, on being afterwards examined, are found to be pieces of flint unaltered, and oxidised iron. Heat is produced when you strike a match. Here is a tube with a piston; into a hollow at the bottom of the piston I put a piece of German tinder, and force down the piston, and you see the tinder is ignited. We have already seen that heat expands a gas; let us now make a gas—air—expand by releasing its pressure, and this we will do by means of the air-pump and a receiver (which contains a pile, having one face in the receiver). On relieving the pressure the needle of the galvanometer moves in the direction of cold, showing that the expanding air has absorbed heat.

Now I will take a vessel containing a mass of air which has been compressed, and although during the act of compression heat was evolved, it has now been standing, and has acquired the same temperature as the air of this room. On now releasing the pressure and allowing the air to stream against the face of the pile, we see that face is chilled. If I take a bellows and blow air, which is hardly at all compressed, against the face of the pile, the pile is warmed by the friction of the air against the face. These experiments led me on to believe that heat was mechanical motion. Imagine a body, and that all particles of this body are moving, as a whole, from point to point in space; if now the body be suddenly arrested, this motion of translation is transformed into a motion of the particles of the body among themselves. It is as if you heard a chime of bells hung on a frame; you might move the frame and bells along as a whole without the bells ringing, but if the motion be suddenly arrested the motion of translation would instantly be converted into a motion of the pieces—that is, the bells would be set ringing. We must imagine radiant heat passing through space, being the vibrations of the particles of the ether, and we must imagine that these particles of ether are not without momentum, but that they are capable of both receiving and imparting similar vibrations to the particles of any solid, liquid, or gaseous matter with which they come in contact. And at this point there is a divergence of opinion. Some people hold that the sun is a source of heat, due to the vibrations of its particles, and that these vibrations are communicated to the particles of that medium—ether—which transmits the vibrations, and that this ether pervades all space, even passing between the particles of bodies. Others suppose that the vibrations of the ether, on coming in contact with ponderable matter, are communicated to that matter. There is this difficult fact that the ether is called an imponderable substance, and as far as we know there is no such thing as weight without momentum. Now, if there be no ponderable matter between the sun and the nearest point of the earth, how comes it that momentum can be communicated? for that mechanical force is communicated is a matter apparent to us all. A tightly-corked bottle full of air, removed from the shade into the sunshine, may have its cork forced out by the movement or expansion of the air. How is this force transmitted through interstellar space by means of a medium which has no weight?

If you hammer a piece of metal, as a leaden bullet, for instance, heat is developed; is this heat an accidental or essential? and are the heat and the motion interchangeable or proportional? This latter question has been answered most satisfactorily in the affirmative. To estimate this proportion it is necessary to have some unit or measure of work. That measure we have in the work expended in lifting a kilogramme to the height of 1 metre. Perhaps the simplest way I can illustrate this is by supposing a hodman had 1000 bricks to carry to a certain height, and he was to be paid so much for the work, without regard to the time or manner in which he performed it; he might carry them up singly or in any other way; when the 1000 bricks were all up there would have been a certain quantity of work expended—that necessary to raise them to that particular height. If 2000 bricks were to be carried to the same height, or 1000 bricks to double the height, the work expended would be twice that in the preceding case. Supposing now that the 1000 bricks fall down from that height, they would expend sufficient work (or with the least addition) to raise 1000 bricks to the same height. And just as the way in which the bricks were lifted up did not interfere with the total quantity of work expended in the lifting, so neither does it matter how they fall, whether quickly or slowly, the work given out will be the same. When a kilogramme is lifted up 1 metre, a quantity of work is stored up in it (potential), exactly equal to that employed in lifting it. If a weight is let drop from a certain distance, and allowed to strike a hard surface, as a plate of metal, it will become heated, or the motion of translation of the mass will become converted into the motion of the particles of the mass amongst themselves. We may compare the heat motion to the vibrations of the leaves of trees. A tree may sway to and fro in the breeze, or the leaves may rustle; there may be the same amount of work employed in the motion of the tree and in the rustling of the leaves. So if you have a kilogramme of matter falling down a metre in height, and falling (say) into water, that kilogramme in falling overcomes friction, the friction develops heat, and the temperature of the water would be raised. It is found that 430 kilogrammes falling through 1 metre would develop heat sufficient to raise the temperature of 1 cubic centimetre, or 1 gramme of water 1° C. Then the phenomena of heat, by this theory of molecular vibration, becomes clear. We can understand now how it is that if two bodies of different temperatures coming together acquire the same temperature, temperature according to this theory is rate of vibration. If I move a heavy body against a light one, or a light one against a heavy one, I can never impart to the second of these

bodies a greater velocity than the first body had, because it is very evident that the latter could never overtake the former. You know there is really more work engaged in moving a heavy body to and fro than in moving a lighter body, and this gives us an idea of what capacity for heat is. They may both be moving at the same rate, but the one may contain more work than the other. In a similar way, too, we can understand why it is that one body can never give to another a higher temperature than it has itself, no matter what the relative size of the bodies may be.

Prof. GUTHRIE concluded by expressing his regret at having so limited a time in which to deal with so grand a subject, and a hearty vote of thanks was accorded to him by his audience.

NORTH STAFFORDSHIRE MINING INSTITUTE.

A meeting of members was held at Stoke-on-Trent, on Monday, when Mr. T. S. Wilkinson, the president, was in the chair, and there was an unusually large attendance. The principal business was the reading of a paper by Mr. Thomas M. Goddard, of Longton, on "The better Communication in Pits by means of Electricity." Having given an outline of the original adaptation of electricity as a means of correspondence, he said electric signalling for pits was brought under his notice by Mr. T. Turner, of Longton, and it was successfully carried out at the Goldenhill Colliery. It was essential to the effective working of this system that the wires should be well insulated to prevent corrosion and consequent breakage. It would take up less room in a shaft than the common method, and however much the wires might be coiled contact remained perfect, independent of distance; thus obviating the necessity for laying down wires in the upcast, and overcoming the difficulties and dangers incident to the corrosion of wires in the upcast. Engine-tenters were not so likely to make mistakes by the new as by the old system, and could signal below ground safely whilst their engines were in motion. Where cages worked in wooden conductors there was danger of the cage tearing the wire from the staples, and cutting off communication between the hooker-on and the engine-tenter, under the old system. Where minerals were got below the level of the downcast, wires could be conducted down and signals communicated as well as if they were sent directly up the upcast, showing this system was peculiarly applicable where ventilation by fans was not in use. Mr. Goddard urged that the system which he recommended was more economical and more efficient than the old method of signalling. Mr. T. Turner experimented with a small battery and a 500-yard coil of wire. Communication was instantaneous. Mr. Homer stated that he had applied electricity in signalling at his collieries, and the practice was in every respect satisfactory. In answer to Mr. Coe, as to the injurious effects upon the wire in the upcast, Mr. Goddard repeated that there was no necessity for using the upcast for signalling by the new system. Several members appeared to be in favour of the new system. Mr. Goddard was thanked for his excellent paper, and it was decided that the paper should be printed and circulated amongst the members.

cilitates the instantaneous inflammation of the gunpowder along the total length of this cylindrical hole, and the whole mass takes fire at the same time. The atmosphere evolved is higher, and the dilation of the gases is considerably increased, the power of the powder being thereby materially augmented; the result obtained on the rock is likewise more powerful, and the amount of smoke is notably diminished on account of the more perfect combustion. The action of this explosive is so strong that it generally tears a certain amount of rock even in front of the extremity of the shot-hole, instead of leaving, as is often the case with ordinary gunpowder, a portion of the hole intact in the rock. The gases emitted are those of gunpowder, and this it which constitutes the superiority over gunpowder and lithofracteur, and compounds of nitro-glycerine, the fumes of which are difficult to expel from the works, and to a certain extent affect the health of the workmen unless sufficient ventilation, as we have said in a former part of this paper, extra ventilation, should be artificially provided. Compressed powder, again, absorbs the humidity of atmosphere much less than ordinary gunpowder. It can be carried easily, and is much less dangerous in its manipulation than ordinary gunpowder, the men no longer risking to tread on grains scattered on the flooring of the magazine, or to spill part of their powder at the entrance of the holes, which has often been the cause of accidents. The charging of the holes, especially when they are in an ascending direction, is considerably facilitated; it is quicker and less dangerous, as the fuse which is put in the central hole cannot be separated from the charge, which is sometimes the case with ordinary powder; for the same reason the misses are very much reduced in number by the use of this explosive. We can recommend the advantage of compressed gunpowder as follows:—Greater efficacy, less smoke, easier charging, fewer misses than with gunpowder. As compared with dynamite, the advantage is to be found in the fact that the fumes left by the explosion are much healthier than those of dynamite and lithofracteur. The power, however, is somewhat inferior, and in the case of very hard rock we would still prefer dynamite.

THE FIRING OF THE SHOTS.—Two principal methods are employed for firing the shots; the one is the well-known plan of using fuses, and the other of firing the shots by electricity. Of late a good deal has been said in favour of firing the shots by the latter method, but though we are perfectly aware that the results are very satisfactory, and the plan is pretty safe, we consider, upon the whole, the use of electricity to be too delicate and scientific a task to entrust to the miners as the firemen. Besides the amount of insulated copper wire which is necessary comes up to a respectable figure in works that are carried at all briskly, and the advantages obtained are not very distinct unless a greater amount of safety for the men be claimed in its favour. Accidents, however, will happen, even when electrical firing is used, as was the case.

A good fuse properly used is, after all, in our opinion, the proper way of setting fire to the shots when this has to be done daily by the miners themselves, and not by some experienced gentlemen like the contractor or the engineer, who can bring to bear in this operation all the advantages of better education and more careful habits than the men themselves can boast of.

THE BOILER.—In reference to this subject very little need be said, no special boiler is required, as, of course, any steam generator will do for the purpose, provided it has sufficient power. In most cases the power can be taken from some existing boilers. In a quarry, for instance, from the winding-engine boilers, or from any temporary portable machine that may happen to be on the spot. Should a boiler hammer have to be provided it is desirable to consider whether this boiler is to be portable or stationary. In the case of a portable boiler it can be either vertical or horizontal. As much can be said in favour of one plan as of the other, and the choice of the system must be affected by local circumstances. Whenever a new boiler has to be supplied we recommend the use of a moderately high pressure (say 80 or 90 lbs., which is the one in common use all over the Continent, and which both in theory and practice is shown to be more economical than low pressures as still generally used in England. We also recommend to adapt to the boilers a small fan-blast, which is found to be very useful on account of the continually varying power required. Should several of the drills be set at work at the same time the pressure on the boiler is liable to diminish very rapidly unless the said boiler be of considerable size, and, therefore, heavy and inconvenient; but if the stoker keeps his eye on the pressure-gauge, and has a fan-blast at his disposal, he can brighten up the fire, and in two or three minutes counteract the depressing action of the great amount of steam suddenly taken away from the boiler, and having the pressure back to what it is desirable to keep it at without interfering with the working of the machinery. It is a very small matter, but it is certainly important, especially where the boilers are none too big for the work they have to perform. We will make no further remarks on this subject, which has nothing very special or particular in itself, and which every engineer is competent to decide upon.

FOREIGN MINING AND METALLURGY.

Copper has been purchased almost entirely of late with the view of meeting the requirements of consumption, and nothing more. The deliveries of Chilean appear likely to be rather considerable, judging from the stocks which have been accumulated. Chilean in bars, delivered at Havre, has made \$87 per ton at Paris; ditto in ingots, 91 $\frac{1}{2}$ per ton; English tough cake, 93 $\frac{1}{2}$ per ton; and Coronoro minerals (pure copper), 91 $\frac{1}{2}$ per ton. At Marseilles, Spanish in plates for consumption has been quoted at 84 $\frac{1}{2}$ per ton. At Rotterdam the quotation for Drontheim has been 50 fls., to 52 fls.; and for Russian crown, 51 fls. The stock of Banca and Billiton tin in Holland at the close of 1873 was estimated at 45,378 ingots, as compared with 44,752 ingots at the close of 1872. The quantity of Banca en route from Java at the close of December was 12,440 ingots; and of Billiton, 12,400 ingots. Banca has made of late 70 $\frac{1}{2}$ fls. on the Dutch markets; Billiton, which has remained comparatively dear, has brought 70 fls. The deliveries of Banca appear to have largely increased last year, as compared with 1872. At Paris, Banca has made 129 $\frac{1}{2}$; Straits, delivered at Havre or Paris, 129 $\frac{1}{2}$; and English, delivered at Havre or Rouen, 124 $\frac{1}{2}$ per ton. The lead markets have remained firm, and sellers have exhibited little disposition to make concessions. On the other hand, zinc has been less firm, and prices have exhibited some irregularity.

The past year has not closed in a very brilliant fashion for Belgian metallurgical industry, and although operations are still being carried on at the works the profits realised cannot be regarded as very remunerative. A further reduction in the price of iron and pig, accordingly, appears not improbable; No. 1 merchants' iron is selling at 94 $\frac{1}{2}$ fls., plates at 12 $\frac{1}{2}$ fls., casting pig at 5 $\frac{1}{2}$ fls., and refining pig at 4 $\frac{1}{2}$ per ton. With labour and raw materials at their present price, the margin of profit remaining for the ironmaster is reduced to very little. The change which has taken place in the aspect of affairs has been very rapid. In June, 1873—little more than six months since—plates were dealt in currently at 16 $\frac{1}{2}$ per ton, and merchants' iron at 11 $\frac{1}{2}$, 12 $\frac{1}{2}$ per ton, while coking coal brought 17 $\frac{1}{2}$, 18 $\frac{1}{2}$, 19 $\frac{1}{2}$ per ton. Now, while labour has remained at about the same rate, and while coal has fallen at the most 3s. to 4s. per ton, merchants' iron has receded more than 2 $\frac{1}{2}$ fls. per ton, and plates 3 $\frac{1}{2}$, 12 $\frac{1}{2}$ per ton. The disproportion here indicated between the reduction in the price of coal and that of manufactured iron is too obvious to justify the supposition that a fresh fall, even although it might be considerable, in combustible could have much influence upon the value of iron. The present low prices current upon the Belgian markets can only be attributed to the scantiness of orders, scantiness which has provoked a competition between the various establishments, some managers apparently preferring to work even at little or no profit to being absolutely idle during the winter months. The future happily presents itself under a more encouraging aspect. Adjudications in Germany, which have not been very numerous of late, begin to resume their normal course. The Selession Company has obtained an order for a considerable quantity of fish-plates from the Bergard Mark Railway Company; and MM. Durieux, of Louvain, and Germain, of Marchienne, have also secured a contract for a large number of trucks and vans for the Royal Sarrebruck Railway. The Sars-Longchamps and Bouvy Collieries

Company commenced the payment, on Jan. 2, of a dividend of 2 $\frac{1}{2}$ per share. The Courcelles-Nord Collieries Company has also been paying a dividend for 1873, at the rate of 8 $\frac{1}{2}$ per share.

At St. Dizier the demand for iron presents no great activity, and few fresh transactions have been reported. From Nancy it is reported that the condition of metallurgical industry in the East of France does not improve, 24 blast-furnaces having been blown out, while orders must be pronounced scarce. In Alsace and Lorraine things are not moving on much better, and in the Luxembourg stocks of pig are accumulating, although the price demanded is only 3 $\frac{1}{2}$ fls. per ton. It is only in the basin of the Loire that there appears to be a fair amount of work, judging from the price of iron, which is maintained at 12 $\frac{1}{2}$ fls. per ton, with a rebate of several shillings per ton in the case of large transactions. Upon the whole, in spite of the dullness existing in the East of France, the new year is considered to have presented itself under improved auspices, the requirements of customers being of a rather pressing character. Managers of works are actively proceeding with new installations. The management of the Champigneulles forge expects to commence operations in a few weeks. MM. Dupont and Dreyfus have commenced the erection of another blast-furnace. The Aubervilliers forges have been leased by the Liverdun Forges Company. The Luxembourg Blast-Furnaces Company has been paying during the last few days a dividend at the rate of 4 $\frac{1}{2}$ per share for 1872-3.

Business remains dull and difficult in the Belgian coal trade; purchasers maintain an attitude of extreme prudence, and there is rather a sharp downward tendency in prices. The concessions which have been made in rates remain undisturbed, and there is an impression that almost all qualities of coal will experience a further fall in Belgium during the current month. The weather has been generally mild this winter in Belgium, and even if it were otherwise the fact would not exert much influence upon the Belgian coal trade. Winter supplies have been generally laid in, and further purchases to provide for great eventual cold could not exert any sensible influence upon prices. Domestic consumption is also, after all, only a small help to the coal trade. The great industrial clients of the trade, and especially metallurgy, are not influenced by the weather, which is a circumstance upon which it is not advisable to count too much. There is, perhaps, some chance of an improved demand for coal in consequence of a revival in metallurgical industry; but here again coalowners must not be too confident. A reduction in the extraction is not always practicable, and for the present stocks have a tendency to accumulate rather than to decline. Upon the whole, the fall which has occurred in prices has every chance of increasing and becoming general. Some complaints have been current of late in Belgium as to the bad quality of the gas supplied in that country; the managers of the gasworks throw the blame on the bad quality of the coal which is delivered to them. Petroleum gas has been employed successfully at Seraing.

The last few days have been comparatively barren as regards the French coal trade. The situation is one of trouble and indecision, but it appears likely to result in advantage to consumers. At Paris, where domestic consumption presents considerable relative importance, the season has been, upon the whole, unusually fine thus far, and although coal has been offered in the French capital at a reduction, it has not readily found purchasers. All that can be said at present is that 1874 opens under more favourable circumstances for consumers of coal, and that they are relieved of the apprehensions which troubled them in January, 1873.

The production of pig effected by the Ougrée Blast Furnaces Company in 1872 amounted to 31,000 tons, or about the same as in the years 1871-2. The production of coke in 1872-3 also remained about stationary at 42,000 tons. The extraction of coal effected by the company in 1872-3 was 77,000 tons, as compared with 83,000 tons in 1871-2. The extraction of minerals by the company also declined in 1872-3 to 69,000 tons, as compared with 77,000 tons in 1871-2.

FOREIGN MINES.

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka Nevada: "Hall, London.—Week's run, 832,000; two furnaces.—MCGEE."

CHICAGO.—Telegram from Mr. E. J. Dowlen, Salt Lake City:—"We have run one furnace 31 days. Net profits, \$10,000."

MINERAL HILL (Gold).—Extract from a letter received by the official liquidator from Mr. Oakes, the superintendent at the mine, under date Dec. 15: "The ore raised during the week is 40 tons, of an average grade of \$50 per ton. The surface shaft is still in alluvium deposit at a depth of 91 feet."

ELDORADO (Gold).—Capt. Sprague, under date Dec. 11, says—The plough shaft is deepened 12 ft.; the quartz, &c., from this is now being stamped from the shaft eastward to the fault. I am hoping the stope will not only pay, but leave a small profit. I am sorry to say the tunnel north and east on the fault has not opened out anything of value. We have 10 men in the stope; this we shall push on as fast as possible. The cold at times is very severe, with some snow; this prevents our working the tailings, else I had intended keeping on while it paid expenses. He adds that the mine costs for November was 27 $\frac{1}{2}$ per cent., paid; gold yield, n/a.

COLORADO TERRIBLE LODE.—Dec. 11: Inside of Mine: At the shaft all timbering is completed; men start east and west in 6th level on Monday; no water. The No. 1 stope in the 5th level is in good ore. In the 4th level drift the heading is still full of veins of mineral; every indication of good ore. Delivery of ore: 10 tons to Stewart. Sale of ore: 21 tons 677 lbs. to Stewart: value, \$343,95.

Dec. 13: Weather cold with snow. I have finished the repairs to Dodge crusher. Shall set up steam to-morrow. Will have the 38th shipment all away by Monday. Shall try Wagner crusher so soon as the 38th shipment is away.—Inside of Mine: All going on well; the 5th level drift still holds good. The 6th, levels, east and west, are both in good mineral. The excitement over the reduction in wages has passed away; men all steady at work. Delivery of ore: 8 tons to Stewart.

FRONTOY AND BOLIVIA.—The directors have advices (Nov. 12), accompanied by a remittance of gold, valued at 775,128, the produce of the mines for October. The accounts for the month of October showed a loss of 281,78. 78.

SWEETLAND CREEK (Gold).—G. D. McLean, Dec. 16: We are in the midst of a heavy storm, and are washing in full blast. I cabled you the same effect to-day, and mentioned the same in diary yesterday. The cut in the creek is not entirely completed, but sufficiently so to obviate any further trouble with the discharge from the new tunnel; we can soon finish or extend it when the water may be off again. Our situation now is comparatively advantageous, and we anticipate good returns. I do not think the water will fall this year, unless from ditch breakages; should it fall otherwise, it certainly can be only for a very short time. We will keep you advised.

BIRDSEYE CREEK (Gold).—G. S. Powers, Dec. 13: I sent you the statement of November accounts on the 11th inst., which I hope you will find quite correct. Mr. J. E. Bowe has been stopping with me since the 5th inst., but will leave here by to-morrow's stage for Nevada City, where he will stop over one night, and then return to Placerville. He will, no doubt, give you a full report of the Birdseye property. The snow fell in the town of You Bet from the 5th to the 18th inst. 34 inches. The Birdseye ditch was blocked from the 8th until the 11th; since that time the water has been coming through it all right. There has been no increase of water as yet, but should the weather turn warm it would give us a supply of water in a short time, for which we are quite prepared.

BLUE TENT CONSOLIDATED HYDRAULIC GOLD MINES OF CALIFORNIA.—Col. C. W. Tozer, Dec. 18: You are, doubtless, fully informed that very copious rains and snows have fallen in California. The storms commencing early in this month have not yet ceased, and I repeat we are assured, sooner or later, a good water season. From our small ditches we are now receiving a small head—say, 500 in. daily—and are using it to great advantage washing down the gravel point above our new working tunnel, thus making an open cut, instead of tunnel, as heretofore, from Enterprise pit to our sluices, undercurrent, &c., below; if much needed improvement, adding greatly to our security for continuous washing from Enterprise. The gravel now being washed lies outside the channel, and will not pay to exceed water money and wages; I think we can wash away this point with one nozzle in about three weeks; shall start up other monitors in Enterprise as soon as more water can be made, and will, as you request, notify you by cable so soon as washing has regularly commenced. The long tunnels, such as South Yuba, have no water from the head as yet, nor will they have so long as the most welcome storms continue. The ditches are filled with snow, but a few days of good fair weather will fill them all with water, and then we have a long season before us. The rock in Bed Rock tunnel continues very hard, and slow progress is being made, probably not more than 25 ft. will be made this month. The late rains giving us times for few hours 2000 ft. in water, have served to show us that all our new flumes, undercurrent dams, and costly improvements added this summer work to a charm.

Jan. 2: The Blue Tent Consolidated Hydraulic Gold Mines of California (Limited) have receiving the following telegram:—"Washing."

UTAH (Silver-Lead).—J. Longmire, Dec. 18: The Mine: The cross-cut through Sturgis lode is poor, there being only iron pyrites and quartz, but so far no appearance of the hanging wall; we have driven across it about 30 ft. When we have cut through to the hanging wall I hope to drive on the part producing copper.—Red Warrior Lode: The level driving south-west from No. 1 cross-cut has considerably improved, and appears to be getting much larger; the lode is running very flat, say dipping 10° only below the horizon. At this point we have driven across it about 20 ft., and the present end of the cross-cut is in an excellent lode, the ore for the last 5 ft. averaging about 45 per cent. of lead. This is a really valuable discovery, and has added some thousands of tons of ore to the reserves. I intend shortly to rise a winze in it to see how far it holds up.—The New Works: My letter of the 11th inst. has already anticipated your enquiries respecting the new works; however, I will repeat. The Cornish rolls are in place, and I think a better machine was never put up. The fixing of Blake's rock-breaker will be completed to-morrow. This machine is nearly worn out; I have, however, repaired

it, cast fresh metal into the bearing, and renewed some of the parts that were badly worn; I hope it will do good service. Both boilers are set and covered in, and the stack is up and braced, both engines fixed, six jiggings machines completed, and the main shaft for running them is in place. The slime-tanks are nearly completed; also one big water-tank 17 ft. by 30 ft., and 5 ft. deep. The launders are nearly all in their places for bringing the water from the brook into the works. The chief work remaining is to arrange circular sieves for sizing the ore, the water pipes and small launders (short) for conveying the water to the various machines, and fixing the paddles, which, by the way, are not yet to hand; the foot notes have arrived, so I presume they are probably at Salt Lake. Our ore-shed, with turn-table and the branch rails for distributing the ore over the building, are all completed, and about 300 tons of ore in it ready for a start.—Weather: We had about 3 in. of snow last night, but the weather is much milder, and would not at present prevent our working.

BASYLE (Eureka).—Dec. 15: The superintendent reports that during the four weeks in November he has raised 19 tons of first class ore, averaging in value from \$100 to \$225 per ton, with about 50 per cent. of lead and 7 tons of second-class ore. This ore was raised in sinking the incline on the Mountain Chief lode alone. The two tunnels have not yet intersected the Uncle Sam and Basyle lodes.

BATTLE MOUNTAIN.—Capt. Richards, Dec. 18: The 113 ft. drift is of a very promising character. The walls are regular and well defined, but containing no ore. A small quantity of water is every now and then met with, which I look upon as a favourable indication. In the new shaft sinking below the 135 ft. level, towards the 188, good progress is being made, the distance sunk being about 12 ft., very good stones of ore having been obtained in-sinking. We have commenced to stop north of John's rise, in the back of the 113 ft. level, to prove if there are any ore which will pay for stopping. The stopes in the back of the 73 ft. level, near the Virgin shaft, is in a large lode spotted with ore. The lode in the back of the 135, at Lake Superior, is of a large size, and containing some stones of ore of good quality.

NEWFOUNDLAND (Lead).—Capt. Curnow, Dec. 15: The following is my report for the fortnight ending to-day:—Engine-shaft sunk 6 $\frac{1}{2}$ ft.; stope No. 2, east of Doctor's shaft, driven 9 ft. 10 in.; stope No. 3, east of Doctor's shaft, driven 18 ft. 10 in.; stope No. 4, east of Doctor's shaft, driven 18 ft. 10 in.; stope No. 5, east of Doctor's shaft, driven 23 ft. 8 in.; stope No. 6, east of engine-shaft, driven 8 ft. 10 in.; stope No. 1, bottom of the 8 fm. level (Copper shaft), driven 18 ft. 10 in. All the places are looking a little better since I last wrote you. We have cut more water in the engine-shaft, and the lode is improving in appearance. Since Sept. 1 we have stopped 63 fms., driven 9 $\frac{1}{2}$ fms.: total, 72 $\frac{1}{2}$ fms. We have now on the mine, dressed and undressed, 125 tons of ore to date. Number of men, 60; boys, 3. One of the Irish miners, named Timothy Sullivan, died on the 6th of this month.

CAPE COPPER.—Railway traffic for the fortnight ending Nov. 29, 234 tons up, and 480 tons down. The Tacna, with outward cargo, and to lead about 620 tons of ore, arrived at Port Nolloth on Nov. 24. The Croydon, with 525 tons of ore, has arrived at Swansea.

MENZENBERG.—R. K. Roskilly, Jan. 3: Dickins' Engine-Shaft: We have completed the cutting of the plat at the 30, and have set the shaftmen (eight) to drive east and west of same on the course of the lode at 16 thalers per lachter. The lode at this point is very large, producing some fine copper ore, with a promising appearance. In the north end of the plat we have also intersected another lode, about 2 ft. wide, underlying south, containing some beautiful copper ore; this will unite with the lode in the shaft in driving west, and also in depth, the junction of which may be looked forward to with encouraging results.

BENSBERG.—J. W. Hoffmann, December: The weather in December was unfavourable for our work, and, on the whole, there is very little change to report, operations being continued as in the previous month. From the north vein in the open cast we got wash ore and carbonate, the latter assaying on an average 40 cent. of lead. At the west end we continued clearing ground, and finally got into very good wash ore, but no carbonate as we had expected. The level west from the open-cast was driven onward, and produced first carbonate, and on driving through this a mixture of galena and undecomposed limestone, similar to that in the Cabin shaft. From other parts of the open cast we continued getting wash ore. On the south-east side we made seven boring trials, which produced nothing of value. From the shaft north and south levels were commenced. At 13 ft. we got into lead ore at the south level; the quality is, however, very inferior, being much mixed with iron pyrites, but it appears to move as we get further into it. The north level, which is now 15 ft. long, has not shown any signs of lead. Owing to the derangements of the pumps, which prevented work being continued in the levels, the progress was not so much as it otherwise might have been. The dressing machinery worked 21 entire days, and produced 45 tons of dressed ore. The new jiggers are to be delivered positively in the first week of January, and will then at once be put up. An arrangement has been made to ensure a better and more constant supply of water for dressing. The permanent building, containing the winding-engine and steam-winch, was put up during the month.

WHAT HONEST AND INTELLIGENT MANAGEMENT WILL DO FOR THE GREAT MINES OF UTAH.

THE REED AND BENSON.—The Big Cottonwood mining district adjoins Little Cottonwood on the north, and Parley's Park on the south. It is well watered and timbered, and the road up the canyon is the finest mountain road in Utah. The scenery is unsurpassed, the mountain peaks are bold and grand, and some of the views are said to rival those of Yosemite. The development of the mines of this district has been slow, and the expenditure of money has been made by individuals instead of by large capitalised companies. It has had no resident newspaper correspondent to advertise it. Its popularity among visitors at the present time is attributable solely to its merits as a rich mineral location. Although only a single ridge of mountains separates it from Little Cottonwood, the veins are entirely different in their characteristics, and the ore on an average valuation very much richer.

The ledges of the prominent mines in Big Cottonwood are fissure veins, while those on Emma Hill are strata veins; besides, the gangue of the Emma ore carries about 20 per cent. silica, while the best mines of Big Cottonwood carry scarcely any, and in many other respects the two districts are widely different in their characteristics, and the difference is in favour of Big Cottonwood. There are two mineral belts in this district, one commencing at the ridge of the mountains above Grizzly Flat, Little Cottonwood, running north, taking in Silver Fork and Honey Comb Gulch, though not, as far as discovered, crossing the canyon. On this belt are the Highland Chief, Wellington, Prince of Wales, Richmond, and other mines. The Highland Chief has been worked considerably, and the quantity of ore taken from it, and now in sight, decides it to be very valuable property. The others are partially developed, yielding good ore, which determines the fact that they are promising and rich prospects. These veins are true fissures, traceable for a long distance, and regular in their course. The other belt commences at the celebrated Flagstaff Mine on Emma Hill, and runs in a direct course over Kesler's Peak across the canyon at Mill A. On this belt is the REED AND BENSON MINE, one of the best mines in the territory of Utah. This mine was discovered in the spring of 1870. With the exception of about one year's interruption when involved in litigation, it has been constantly worked, and developments carried forward. The altitude of the discovery is, perhaps, higher than any discovery yet made in Utah, and the inaccessibility of its location has made an outlay of a large amount of money necessary to make the property at all available. Mountain roads had to be built, trails made around almost impassable bluffs where men had to be suspended by ropes to drill and blast a tunnel 500 ft. in length through hard limestone, had to be run. The costliest and most perfect tramway, 1600 ft. in length, ever built in the United States, going over a nearly perpendicular bluff 400 ft. high, extensive buildings covering dump, passage ways, living apartments capable of keeping comfortably 100 men, store-rooms for 20,000 sacks of ore, large ore floors, assay office, blacksmiths' shops, superintendents' quarters, &c. All completed in a most substantial and thorough manner, with large one-house at foot of tramway, with tramway all housed in, making it the most perfect property for economical working of a large mine to be found in Utah, if not in the United States.

The mine is located a very short distance over the divide from Little Cottonwood, in what is known as the South Fork of Big Cottonwood canyon, and about $\frac{1}{2}$ mile on a direct line from the Flagstaff. It has been visited by most of the experts and practical men who have visited Salt Lake City, and from the first has been considered a first-class property. We make a quotation from Mr. Henry Sewell's letter to the London *Mining Journal*, of August 15, 1872, and published in that paper on Sept. 7 following:—"Those of Spain (referring to the mineral veins) are similar to those found in Utah and Nevada, producing similar classes of ore, carbonates of lead rich in silver, and mostly strata veins. In the vicinity of the Almaden mines, I found them to consist mostly of contact veins, having the limestone as a hanging-wall, and sandstone as a footwall. In Utah I have found that most of the veins in limestone are strata veins, such as the Emma, Flagstaff, and other mines. The Reed and Benson Mine, in Big Cottonwood, in the Wasatch range, is composed of a fissure vein cutting the strata, and joined at a depth of 60 ft. from the surface by two strata veins, where the large chamber of ore was discovered."

The main formation of the mountain is silica, lime and trap, or what is now commonly termed porphyritic banded rock, and to all external appearance a regular stratified formation, the vein cutting through the lime strata to the surface, at a vertical elevation of 1300 ft. above the valley. The lime strata continuing as the east wall of the ledge to the depth of 600 ft. perpendicular from the exterior, and about 650 ft. linear (so far developed), while the hanging-wall is perfectly regular and unbroken the same distance, and carrying over 80 per cent. of silica. The ore and vein matter attaining from the surface to the depth of 150 ft., the extreme of 15 ft. in width, while the vein matter, now being worked at the depth of 600 ft., has attained an average width of over 60 ft. This is conclusive that, as the mine is developed in depth, the body of mineral will continue to increase until the main floor of the mine is reached, which will be at a perpendicular depth of 1300 ft., when both walls will be regular, and the principal and main body of ore exposed. The other mines on this belt—the McDonald and Sailor Jack, on Kesler's Peak, the Montreal, on Montreal Hill, and many other prospects of a very flattering character, that need only capital and careful working to develop into good and rich properties.—*Mining Gazette*, Salt Lake City, Utah, Dec. 13.

STATEFIELD FURNACE COMPANY.—Since I received the telegram, announcing the complete victory of the suit instituted by the above company against the Aiken infringement and fraud, I have received private advices that the stock of the company has risen considerably. The company have already spent \$15,000 in various suits, and have always come out victorious. I, therefore, notify these individuals who have been fraudulently circumventing the patent of the above company, in company with Mr. Aiken, to desist from using the patent, otherwise the damages will be made rather heavier than they imagine, this besides the royalty on the ore that they have already worked. The legal powers for proceeding against all infringers will be here in a day or two.—HENRY SEWELL: Agent for the Statefield Furnace Company.

THE EMMA STRIKE.—The recent strike in the Emma Mine continues to be the subject of much comment in mining circles, and many rumours are in circulation concerning the extent of the ore. Some say the new vein is 10 ft. in width, while others claim to have definite information fixing the width of the ore at 49 ft. There can be no doubt that the body of ore in the new workings is one of the most extensive yet discovered in this celebrated mine. The Emma officials are noted for keeping the affairs of the company and the condition of the mine from the public, and concerning this last strike they remain unusually silent. Should the body of ore prove anything like as extensive and rich as some say it is, a sudden upward tendency in the stock will soon be observed.

STRIKE IN THE DAVENPORT.—A strike, which is said to be the richest and most extensive ever found in the Davenport Mine, Little Cottonwood, was made last week. The new find is 40 ft. below the track level, and is about 8 ft. wide, and of grey carbonates and feldspars. The miners are now taking out immense quantities of ore from the new workings.—*Salt Lake Herald*, Dec. 12.

FLAGSTAFF MINE—SUDDEN RETRIBUTION.—Maxwell, the ex-superintendent of the Flagstaff Mine, in Little Cottonwood, has not made much by opening his heart and a budget of figures to our contemporary. It was amusing enough to read the attack of "E. L." in St. Louis upon the personal character and ability of Capt. Forbes, an English gentleman of the highest social and financial position in London; but it was rather more than amusing to read the details and assumed facts of the Flagstaff business in the London *Mining Journal*. It is not unnatural for men to be vindictive, but it is sometimes a costly luxury. Marshal Patrick will hereafter look after the Flagstaff.

THE EMMA MINE.—We understand that Mr. H. Sewell cabled for 60 Emma shares yesterday. The answer was—"Bought 60 at 37. 8s." That is right; let the Salt Lukers prove their faith in their mines by deeds instead of words, and show our British cousins what we are made of. We have here a tangible proof of Mr. Sewell's opinion of the present management of the Emma Mine.

CAMP FLOYD MILL.—Yesterday we saw a letter from Lewiston, in which it was stated that this mill, notwithstanding the severe frost, was running steadily, and that five bars of silver bullion would be forwarded by Friday to the First National Bank. Neither elements or human beings appear to succeed in trying to freeze out this successful mill.—*Salt Lake Tribune*, Dec. 18.

MINERAL RESOURCES OF NEW SOUTH WALES.—A well-executed map of the colony, recently issued by the proprietors of the *Mining Herald and Mail*, Sydney, has been published in this country by Mr. G. STREET, of Cornhill; it gives valuable information as to the mineral and other resources of the colony, and as the details are collated from the official surveys and other equally good sources, full reliance may be placed in its accuracy. The explanatory note and references indicate the extent of railroads, telegraph lines, and public roads, land capable of cultivation for various kinds of produce, including the vine, sugar, tobacco, &c. Besides gold and most other metals which the colony is well known to possess, it will be noticed with some interest just how large are the tracts of coal-bearing country. The map is not published for sale, but for distribution. Mr. Street has also forwarded excellent portraits of the Duke of Edinburgh and the Czarevna Marie of Russia from blocks specially prepared for the proprietors of the newspapers already mentioned. The workmanship is all that can be desired, and in New South Wales the portraits cannot fail to be appreciated.

TURBINES.—A turbine constructed according to the invention of Mr. E. OHL, engineer, Bielbawer, consists in forming what is termed a reverse float on the convex side of the usual float. This reverse float has a port opening into the ordinary float or bucket, which may be formed by a steel guard cast on the sides of the turbine. There is an opening from the reverse float through the sides of the turbine, through which the float or bucket is ventilated, the air passing through the port or opening from the reverse float to the ordinary float. It will thus be seen that the turbine bucketing is ventilated. This arrangement of a ventilating reverse float may be applied to any hydraulic impacting motor.

LONDON GENERAL OMNIBUS COMPANY.—Traffic receipts for the week ending January 4, 1874, 10s. 5d.

BREAKFAST—EPPS'S COCOA—GRATEFUL AND COMFORTING.—By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills.—*Civil Service Gazette*. Made simply with boiling water or milk. Each packet is labelled—"JAMES EPPS AND CO., Homeopathic Chemists, London."

MANUFACTURE OF COCOA.—"We will now give an account of the process adopted by Messrs. James Epps and Co., manufacturers of dietetic articles, at their works in the Euston-road, London."—See article in *Cassell's Household Guide*.

MOST PEOPLE KNOW MORE OR LESS WHAT SICKNESS IS, what penalties it inflicts, what anxieties occasions, therefore little persuasion should be needed to impress on every invalid that during broken weather strenuous efforts should be made by the afflicted to recover health before unrelenting cold and trying storms set in. Holloway's twin medicaments are the remedies highest in repute for all sufferers under disease, as well as for everyone who can estimate the pleasure that belongs to health, and realise the pain that springs from sickness. Throat ailments, coughs, wheezing, asthmatical affections, shortness of breath, morning nausea, and accumulation of phlegm, can readily be removed by rubbing Holloway's fine ointment twice a day on the chest and neck.

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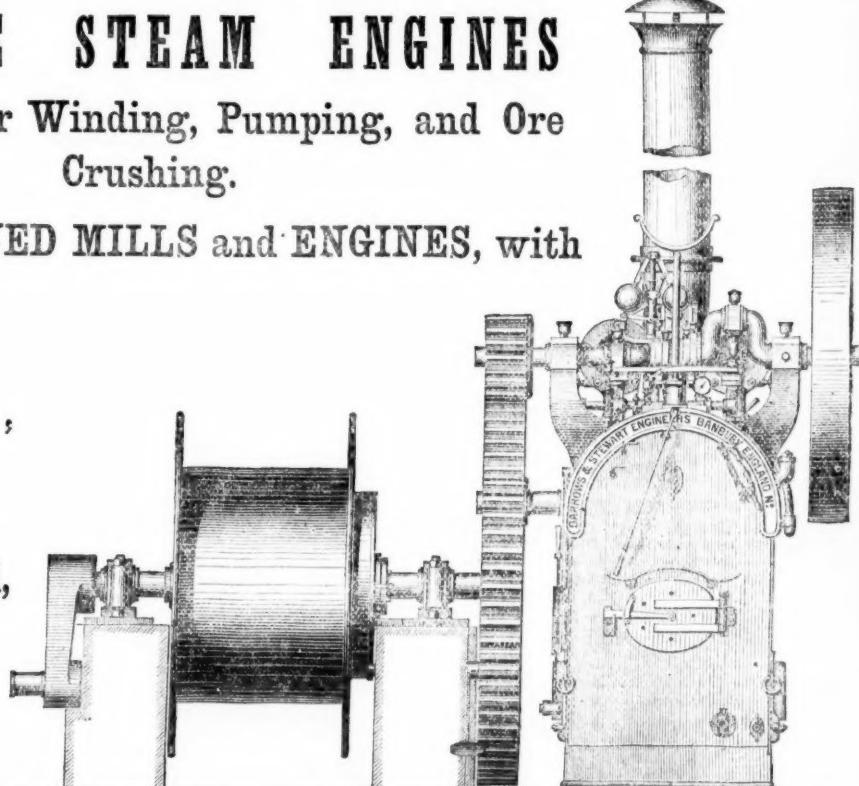
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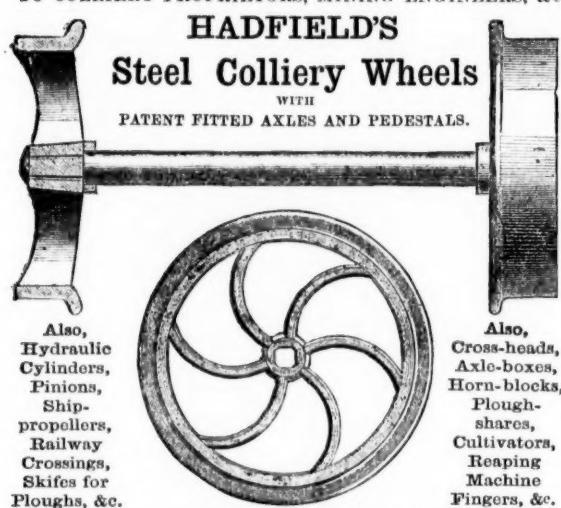
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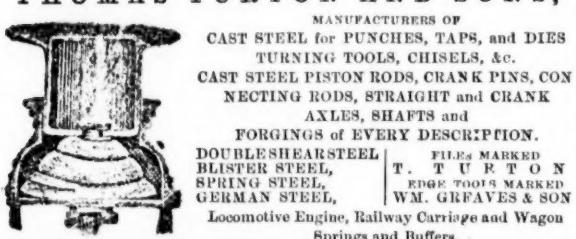
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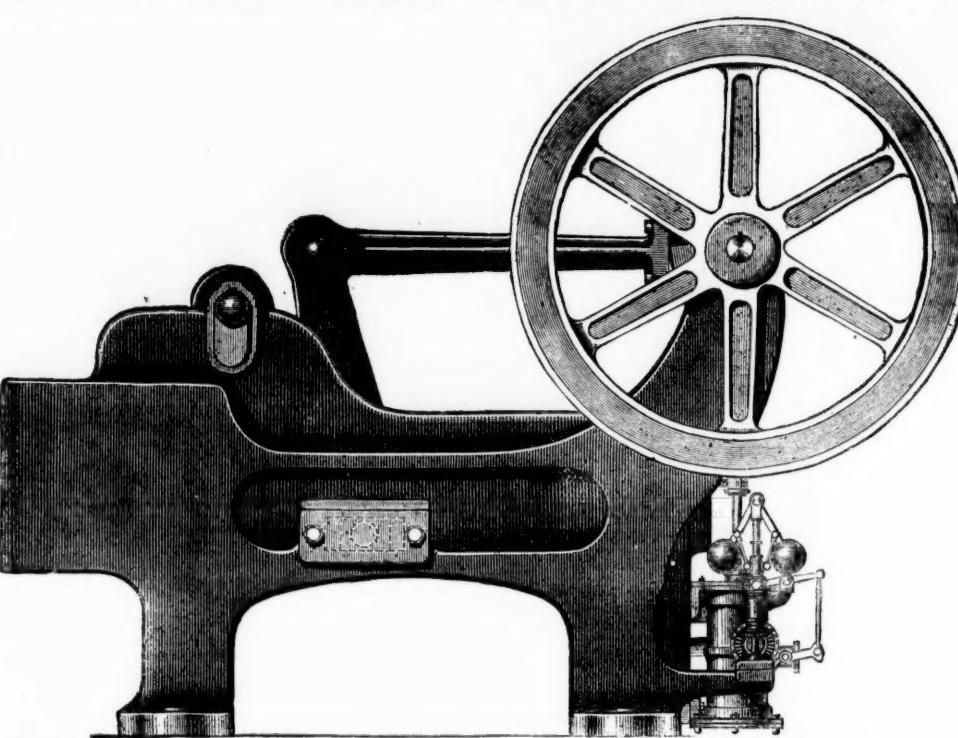
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